SEPTEMBER, 1944

# Industrial FINISHING

Published Monthly in the Interest of ... Industrial Finishing

Freedom's FORGE!
When Hitler persuaded Tojo to attack America he sealed his own doom. No nation on earth can match the industrial production of the U. S. and no nation (or combination of enemy nations) can equal our war production once this might is unleashed. In less than 3 years this industrial giant has forged enough weapons to win the war in Europe. V-day, when it comes, will be a real Victory for American industry and we of the Lilly Varnish Company are proud to be a part of this American industry.
LILLY VARNISH COMPANY
Indianapolis, Indiana
THE LILLY COMPANY, High Point, North Carolina

# 2 big guns in the war against fungus

## ROXALIN 71-2202A AIR DRY LACQUER

THOUSANDS OF PIECES of communication equipment are protected against moisture and fungus attack on our far flung tropical fronts by a post-assembly coat of Roxalin 3314. Easy to apply by dip, spray or brush, this one-coat air dry lacquer meets Signal Corps specification, 71-2202A. Not only does the finish prevent infection of the surface by micro-organisms but actually provides a zone of inhibition around the coated areas. If any spots are missed, a certain amount of protection is still present.

## ROXALIN'S FUNGUS-RESISTANT THERMOSETTING CLEAR

MAKERS OF COMPONENT PARTS of equipment destined for tropical service are more and more turning to Roxyn-11c-200391 for fungicidal protection. In addition to its fungicidal properties, which meet the same high standards as the air dry lacquer, this thermosetting finish has unusual arc resistance, moisture resistance and high dielectic strength. Especially noteworthy is the stability of the fungicidal agent through the heat ranges necessary to curing.

ROXALIN *Flexible* FINISHES

INCORPORATED

ELIZABETH, N. J. • NEW JERSEY

# A CLEAN PART *for* A FRESH START

**IN 60 SECONDS,** sometimes less, sometimes as much as five minutes, Enthone Enamel Stripper de-coats baked synthetic enamels of the following types:

| | |
|---|---|
| UREA-FORMALDEHYDE | RESYL |
| GLYCEROL-PHTHALATE | GLYPTAL |
| PHENOL-FORMALDEHYDE | MELAMINE |

It's many times faster than the best type of caustic strippers.

**A PRODUCT OF PIONEERING RESEARCH**—first of its type to be synthesized, marketed and patented.* It is an emulsion, used diluted with water at room temperature or heated up to 180° F.

**FAST ACTION**—The action on the enamel is physical rather than chemical. First it contracts, then lifts and slips off without trace or blemish. No sign of pigment or solid residue is left on the work as in the case of caustics.

**BASE METAL UNDEFILED**—Enthone Stripper is mildly alkaline (pH 9-10) and does not attack steel, zinc, aluminum and magnesium or other metals. Anodized aluminum is unharmed and can be re-enameled without re-anodizing.

**SIMPLE OPERATION**—Work to be stripped is dipped in a tank containing the solution in the usual manner, mechanically or manually, and remains just long enough to remove the enamel. Then rinse in running water and dry. It is now ready for refinishing. Write today for FREE TRIAL SAMPLE.

**THE ENTHONE CO.**

**441 Elm Street** **New Haven, 2, Connecticut**

*U. S. Patent 2,242,186

ENTHONE ENAMEL

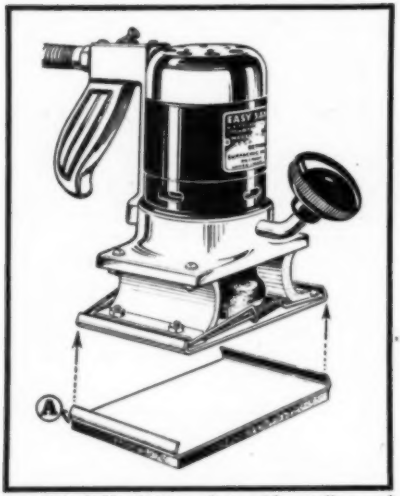
# STRIPPER

**NO CAUSTIC ACTION**

for SYNTHETIC ENAMELS . . . . . Urea-formaldehyde, Resyl, Glyptal, Glycerol-phthalate, Etc.

## Quickly Change Sanding Pads to FIT Your Job

WITH THE




A — Detachable bottom plate with sanding pad attached.

*Easy*
RECIPROCATING
ELECTRIC SANDER

**1** The "Easy" provides an INSTANT SNAP ACTION method for attaching the correct type sanding or rubbing pad to fit the job.

**2** Sanding pads are available for working curved or flat surfaces on *Wet* or *Dry* application.

EXTREME SIMPLICITY of the "EASY" detachable bottom plate provides an instant snap-action method for attaching the correct type sanding pad to fit the job. This means increased operating efficiency.

For example, some applications require pads of special size, shape or degree of flexibility. In rubbing work a separate felt pad is indicated for each grade of rubbing compound. For quick change from wet to dry work a dry pad can be instantly attached, thus saving time ordinarily wasted waiting for the pad to dry. Again, a pad of the correct size is better in cleaning restricted areas of small parts.

### A RUGGED PORTABLE, ELECTRIC UNIT

The Easy Sander is designed and precision built of selected material for maximum efficiency. Rugged 115 or 220 volt, powerful, universal electric motor. Operates from any A.C. or D.C. outlet. All moving parts mounted on ball bearings. Drive mechanism sealed and packed in grease. Forced, dust filtered cooling. Two comfortable handles. All insuring ease of operation, long life and trouble-free performance.

## DETROIT SURFACING MACHINE CO.

7434 W. DAVISON DETROIT 4, MICHIGAN

TWENTIETH YEAR OF PUBLICATION

# Industrial FINISHING

W. H. ROHR, Editor E. A. DOSCH, Assoc. Editor

Vol. XX, No. 11 SEPTEMBER, 1944 $2.00 a Year

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Eastern Representative: C. A. Larson, 254 West 31st St., New York 1, N. Y.; Phone Penna. 6-9049

# We're ready for BOTH Great Offensives

Our first concern today is production for the great military offensive and complete victory over the Axis powers.

But after Victory another great offensive will be required by industry. This will be the vital job of converting and maintaining production for peace. To keep production at the high levels essential to a stable economy will require all the ingenuity and resourcefulness which can be mustered.

In the field of product finishing Glidden is prepared to keep pace with industry's needs. Finishing developments designed to speed production of war material will bring revolutionary advances in peacetime application. Many of these Glidden developments are already being field tested for postwar production. These include precision formulations of finishing materials for use with modern conveyors, controlled humidity and temperature baking equipment and infra-red baking.

Glidden's experience and research is available to you in solving present or postwar finishing problems. Just drop us a line.

THE GLIDDEN COMPANY • Cleveland 2, Ohio

TIME-TESTED

**AXS-1167**
**ETHYLCELLULOSE PROTECTIVE STRIPPING COMPOUND**

A plastic compound for preventing corrosion of metal surfaces. Its effectiveness has been proved in the protection of machined parts during storage and shipment. With variations, such as transparency, has great postwar possibilities in the metal industries for indefinite preservation of metal surfaces—particularly machined parts.

Write for details on specific applications.

GLIDDEN *Pacemaker in Paints*

# Letters from Readers

## Tumble Painting

We are told that one of your magazines has a good description of tumble-barrel-painting of small wood turnings. We are interested in this information. Would it be possible to obtain a copy of this number. . . . ?—E. R. Co.

We would appreciate your sending us information concerning the tumbling of small wood parts, using lacquer or oil paints. Please advice us who makes this kind of equipment.—G. Co. (Utilo Products).

We are sending you a reprint of the article on tumbling. Also, we are including names of manufacturers of tumbling barrels.—ED.

## Wood Toy Finishing

Will you kindly forward whatever information and advice you can regarding the color-finishing of toys? My problem at the moment is one of getting cross sections of a tractor body colored in one application. By cross sections I mean end and body cuts across the wood grain. Is there a dye applicable to such an operation? I would prefer to have a dipping operation for speed and economy.—W. S.

## I. F. Articles Valued in South Africa

We are subscribers to INDUSTRIAL FINISHING, and find many articles which are of interest to us and our customers. We intend to circularize, from time to time, extracts from your periodicals to the specific industries in this country in order to assist their finish problems, and would be glad to get your permission to do so. We would like to mention that we will add to these circulars that we have taken the extracts from INDUSTRIAL FINISHING, and if you have any other wishes in this direction, kindly let us know.—C. C. LTD., JOHANNESBURG, S. AFRICA.

You may use INDUSTRIAL FINISHING as requested, with the customary credit line, and you might also add "Indianapolis, Ind., U. S. A."—ED.

## Coating Seat Spring Assemblies

We have a customer who has been dipping automobile seat spring assemblies in a large horizontal dip tank. This customer is interested in the possibilities of changing to a flow-coating system similar to that generally used for bed springs. So far as we know, each manufacturer who is using a flow-coating system for bed springs and the like has engineered his own installation.

However, it is possible that one or more manufacturers of finishing equipment has had experience in the design and installation of flow-coating systems. Therefore, at the request of our customer, we are writing to inquire whether you can refer us to any equipment manufacturer who has developed equipment for this purpose. Any other light that you may be able to throw on the subject will be greatly

We have given some information and suggestions to this inquiry, in a letter. —ED.

## Removes Blackout Paint

In August issue of INDUSTRIAL FINISHING, "Letters from Readers," pages 5 and 6, "To Remove Blackout Paint," the following may help your reader. It has proved successful on some types of blackout paint. However, the adhesive tape used may be causing the trouble; if so, this will do no harm.

Soak painted areas with a solution of 25% ammonia and 75% water. Then the paint can be removed with an ordinary scrub brush or scraper. Paint has been completely removed from a window of ordinary size in five minutes.

I have passed this information on to several plants in this district and they have reported it to be very successful. —U. LABORATORIES.

## This Fireproofs Wood!

Recently our attention was called to your August issue wherein an inquiry appeared under the title, "Fireproofing Wood" (page 5). We are sending you

# *New Items? YES...*

## PLENTY OF THEM!!!

Tell us your finishing problems and we will tell you about the new items we have developed to solve them.

**V. J. DOLAN & COMPANY, INC.**

*Manufacturers "Unquestionable Quality" Industrial Finishes*

1830-32 NORTH LARAMIE AVENUE CHICAGO, ILL.

# I. C. D. FORMULA NINE

## NON-INFLAMMABLE « *wax free* REMOVER »

**for paint, varnish, lacquer, baked enamel, adhesives**

**EASY TO APPLY—NO AFTER-CLEANING**

**ORDER TRIAL GALLON AT DRUM PRICE**

**I. C. D. FORMULA 9** is the standard of safety and quality . . can be sprayed or brushed . . doesn't raise grain nor discolor . . quickly removes all kinds of finishes and coatings . . costs less to use . . saves time, labor and material.

**SPECIALTY COATINGS**—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

**INDUSTRIAL CHEMICAL DEVELOPMENT CORP.**

347 MADISON AVE. NEW YORK 17, N. Y.

a circular referring to "Flamunize," which is available for such purposes, and it will be appreciated if this could be called to the attention of the inquirer.

"Flamunize" is a harmless, odorless liquid that can be applied by dipping or spraying. The treatment remains effective for five years.—DISPLAY CREATIONS, INC.

## Cleaning Machine to Use Inflammable Solvents

We are interested in obtaining a spray-cleaning machine designed for use with inflammable solvents. Can you furnish us with the names of companies which can supply such equipment?—H. H.

We are submitting names and addresses of a few companies who, we think, can supply what you want.—ED.

## Conveyors Wanted

We will appreciate it if you will supply us with the names and addresses of builders of furniture-finishing conveyors.—A. B. Co. (Furniture).

Information supplied.—ED.

## Salt Spray Tests

We are intereted in obtaining a small salt-spray testing outfit, preferably a portable one. It seems to me I saw one advertised in your magazine some time ago, but I cannot find it now. I wonder if you could give us any information about this matter? We would appreciate it very much.—E. K. Co.

Information supplied.—ED.

## Abrasion Tests for Enamel Coatings

We are now in the midst of trying to develop a finish for domestic refrigerator shelves that can be used as a substitute for hot tinning in the event that domestic refrigerator production is released around the first of this year.

We are receiving numerous samples from paint manufacturers, and as this application requires a high abrasion resistance, we want to set up standards to determine the comparative merits of various coatings that are offered. We also want to set up the proper type of abrasion testing device to accomplish this result.

Can you give us the necessary in-

SAVE
Man-Hours

USE
PERFECTION
SYNTHETIC
*Flat Finishes*

Perfection's unique blend of fossil gums and gloss varnish provides all the beauty of rubbed finishes—WITHOUT THE RUBBING—saving countless man-hours of labor. Here is a clear and transparent finish—impervious to alcohol and water—free from orange peel—and available in a full range of sheens that will not change on standing. Put efficient, economical Perfection Flat Finishes to the test in your plant.

PERFECTION PAINT & COLOR CO.
Indianapolis 2, Indiana

*Plant Manager: "Say, Bill, how did that S-I-P Sealer work out?"*

*Foreman: "Swell, Mr. Jones! It's a honey! Sands just right, and gives our topcoat a perfect build. I'm in favor of getting them to do some work on that new stain we were talking about, too."*

*Manager: "OK, Bill. I'll put in a call for them right away."*

**That's right. When you want**

**PRACTICAL**
**Laboratory Cooperation**

**on any finishing problem, call S-I-P. The number is Evansville 4-4255, and there's no obligation.**

**STANDARD INDUSTRIAL PRODUCTS**
**Inc.**

**EVANSVILLE 4, INDIANA**

**P. S.** Do you need BETTER NON-PRIORITY FURNITURE FINISHES? S-I-P has 'em—easy working, dependable.

formation that we need in regard to abrasion resistance standards for the paint industry, as well as make recommendations to us on the type of abrasion machine or device which we should use in these tests?

While we are on this subject of refrigerator shelf finishes, we are wondering if in your experience you have come across a coating that would lend itself to this application. Refrigerator shelves are usually made of basic steel wires assembled together by the electric welding process. Any finish for this product should be highly corrosion-resistant, have good adhesion, and not be brittle. We would appreciate any comments you may have to make on this subject.—U. W. Co.

An abrasion tester is manufactured by Taber Instrument Corp., North Tonawanda, N. Y. Several advertisers in INDUSTRIAL FINISHING can probably supply you with an enamel suitable for your purpose.—ED.

## Decal Borders on Furniture

Instead of hand tooling leather tops, some of the Grand Rapids manufacturers apply what looks like a decalcomania border. Have you any information on this work? We have recently seen some of this border applied to mahogany tops and we would like to know how it is done. Any information you can give us will be appreciated.—E. I. Co. (Furn. Mfr.).

Probably it is a decal border. We are referring you to a progressive manufacturer of decals.—ED.

## Silk-Screen Stencils

One of our customers in South America is interested in obtaining information on the preparation and use of silk screens in sign painting. We recall that in past issues of INDUSTRIAL FINISHING there were some discussions on silk-screen work, and if it is at all possible, we would appreciate your letting us have any reprints or tear sheets of these articles that might be available. —G. P. Co.

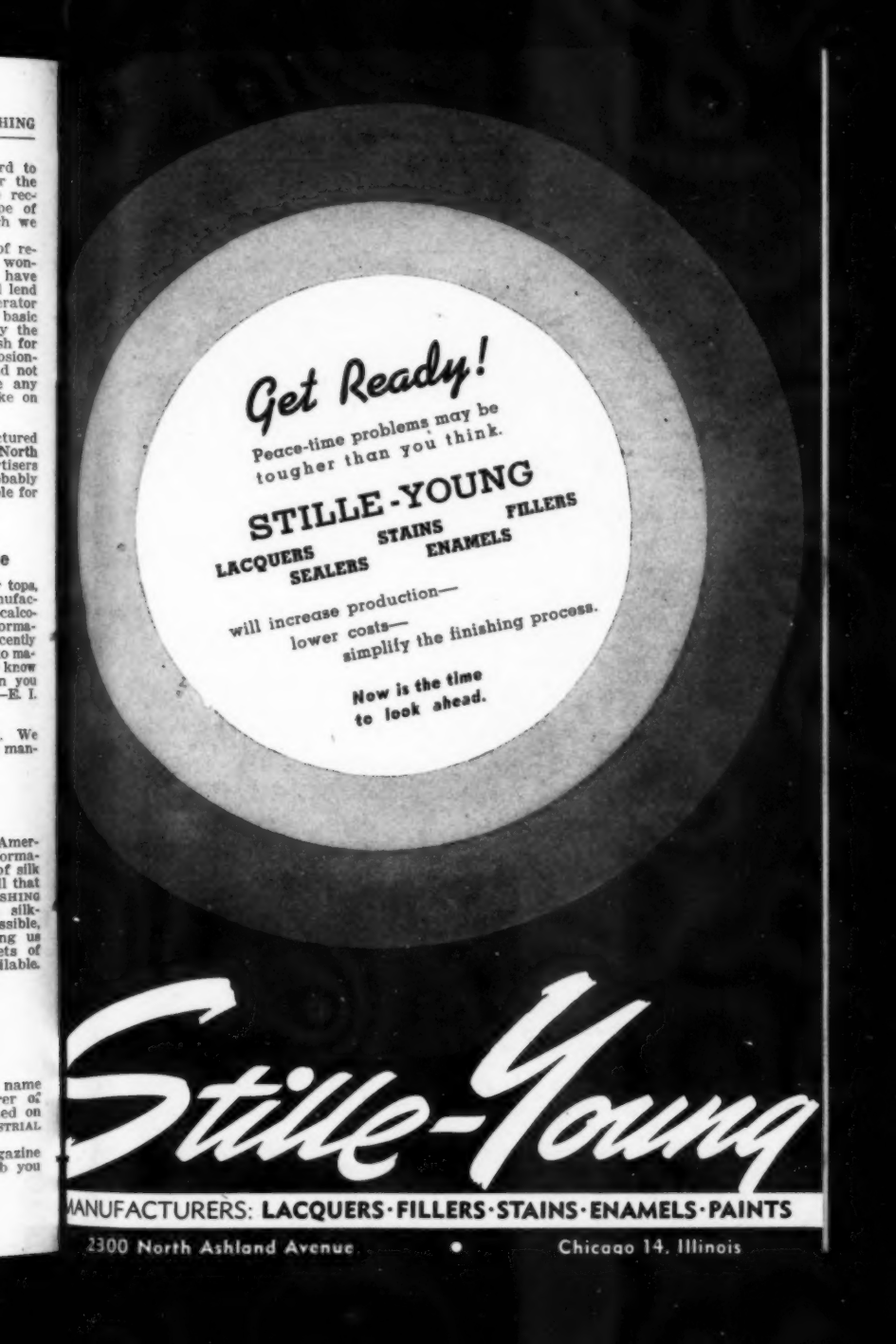
Information supplied.—ED.

## Heat-Resistant Finish

Will you please forward the name and address of the manufacturer of the heat-resistant finish mentioned on page 74 of the July issue of INDUSTRIAL FINISHING?

We enjoy reading your magazine and appreciate the very fine job you

*(Continued on page 98)*


Get Ready!
Peace-time problems may be tougher than you think.
STILLE-YOUNG
LACQUERS
SEALERS
STAINS
ENAMELS
FILLERS
will increase production—
lower costs—
simplify the finishing process.
Now is the time to look ahead.
Stille-Young
MANUFACTURERS: LACQUERS·FILLERS·STAINS·ENAMELS·PAINTS
2300 North Ashland Avenue • Chicago 14, Illinois

# Do you know...?

**Q.** The wings on this plane have been:

☐ Shot off ☐ Unhinged for repair
☐ Folded back to save space

**A.** Folded back to save space. When pushed out into flying position again, wings are attached to fuselage with steel pins. Certain parts of these pins must be electro-plated with chromium. Many plane manufacturers today use a special Permacel tape in "masking" sections of vital parts during electro-plating.

**Q.** The lining on this post-war handbag will probably be made of:

☐ Cloth ☐ Leather ☐ Coconut fibre

**A.** Cloth. And after the war, as before, manufacture of handbags will be greatly speeded by use of Permacel cloth tape (Jonflex). Operator assembles sections of "liners," sticks them together with Permacel, then puts bag through sewing machine as a unit. Eliminates need for holding separate sections in position manually—saves time—cuts costs.

**Q.** This quick-reading production chart was made with:

☐ Colored paper ☐ Colored tapes
☐ Colored pencils

**A.** Chart was made with Permacel's companion, Texcel Cellophane Tape, which is made in a variety of colors, as well as in a transparent form. Colored Texcel tape is also used to identify fuel lines and wires. Transparent Texcel has many office uses—mends torn letters and ledgers, seals packages, eliminates all fuss with glue and strings.

## Quiz on timely production short-cuts—No. 6

**Q.** Prior to shipment, stoves are usually taped in order to:
☐ Protect parts ☐ Identify models
☐ Keep moisture out

**A.** Protect parts. Stove pictured has been taped with Permacel cloth tape (Jonflex) to hold burners and grates in place, prevent doors from opening, keep trays from rattling. Today this tough, clean-stripping Permacel tape is also used to seal shell canisters, signal flares and many other ordnance items.

**Q.** What's this man doing?
☐ Leveling earth ☐ Laying mines
☐ Searching for mines

**A.** Searching for mines. In newest U. S. land mines, Permacel moisture-proof cloth tape (Utilitape) plays an important part. After the war, manufacturers whose products must be able to withstand corrosion will find this Permacel tape unequaled for moisture resistance combined with extreme flexibility.

**Q.** Which of these types of pressure-sensitive tapes can help speed and improve *your* production?
☐ Paper ☐ Cloth ☐ Cellophane
☐ Metal ☐ Glass

**A.** All of these types of Permacel tapes are today used in war production. Many war uses will prove helpful in your business when you return to post-war work. Meantime, our research laboratory facilities are available to you for development of special tapes to meet war or post-war needs.

**Permacel**
**Industrial Tapes**
INDUSTRIAL TAPE CORPORATION
*New Brunswick, N. J.*
*Makers of* Texcel Tape

THE importance of these ten points cannot be over-emphasized, yet an aircraft finish may meet every specification requirement, pass Government inspection tests, and fail when put into actual use. The reason—

*Varying shop conditions.*

Because of our long experience in the aviation field we realize the great importance of giving studied consideration to the varying conditions under which our finishes are used, and consequently have been remarkably successful in formulating "tailor-made" finishes for our customers. This familiarity with individual shop conditions and application methods enables our Technical forces to "build in" the necessary adjustments, often saving the users of our materials much expense, time, and trouble.

**Pittsburgh Industrial Finishes**

In producing Pittsburgh Industrial Finishes for a wide variety of uses, Pittsburgh technical men enjoy one great advantage—Pittsburgh has developed the• *Molecular-Selection* process, by which ordinary oil is taken

# 10 GOOD REASONS

## for using PITTSBURGH Aircraft Finishes

1 Durability
2 Proper Adhesion
3 Satisfactory Workability
4 Required Flexibility
5 Adequate Hiding
6 Proper Drying
7 Satisfactory Mileage
8 Proper Texture
9 Exact Color Match
10 Proper Gloss

apart, molecule by molecule. The result is a brand new oil, which vastly improves drying and enables us to control uniformity of paint performance.

Expert advisory service is offered to users of Pittsburgh Industrial Finishes. Our extensive experience in the field can often save you time and money.

PITTSBURGH PLATE GLASS COMPANY, Industrial Paint Division, Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Mich. The Thresher Varnish Co., Dayton, O.

**PITTSBURGH** *Industrial* **FINISHES**

PITTSBURGH STANDS FOR QUALITY PAINT AND GLASS

# HARDWOOD FINISHING HEADQUARTERS

**SINCE 1888**

**LAMPS**

| | | |
|---|---|---|
| Glass Alcohol | | Each |
| Metal Alcohol | | Each |

**LEAF**

| | | |
|---|---|---|
| Gold XX Deep 3⅜"x3⅜" | Pack | Book |
| Silver, Genuine, 3¾"x3¾" | Pack | Book |
| Metal Leaf 5½"x5½" | Pack | Book |
| Aluminum Leaf 5½"x5½" | Pack | Book |

**LITHARGE** ..... Pound

**LITHOPONE** ..... Pound

**LOGWOOD**

| | |
|---|---|
| Crystals | Pound |
| Extract | Pound |
| Chips | Pound |

**MASKING TAPE**

Scotch Wet or Dry ..... Per Doz. ..... Per Roll
¼", ½", ¾", ⅞", 1", 1¼", 1½", 2", 3"

**MEASURES** Gal. ..... ½ Gal. ..... ¼ Gal. ..... ⅛ Gal. ..... Each

**MIXING CUPS** ..... Bdl.

**MOSS, Irish** ..... Lb.

**NEW WOOD**

48/1-lb. Can ..... Doz. ..... Each

**ORANGE MINERAL** ..... Bbl. ..... 10-lb. ..... lb.

**OIL**

| | | |
|---|---|---|
| Aqua | 5-Gal. | 1-Gal. |
| Castor | 5-Gal. | 1-Gal. |
| Crude | 5-Gal. | 1-Gal. |
| Furniture Rubbing RO13 | 5-Gal. | 1-Gal. |
| Lemon, Acme | 5-Gal. | 1-Gal. |
| Linseed, raw or boiled | 5-Gal. | 1-Gal. |
| Machine | 5-Gal. | 1-Gal. |
| Neatsfoot | 5-Gal. | 1-Gal. |

**OIL (Continued)**

| | | |
|---|---|---|
| NeverRust | 5-Gal. | 1-Gal. |
| Paraffin | 5-Gal. | 1-Gal. |
| Signal | 5-Gal. | 1-Gal. |
| Sperm | 5-Gal. | 1-Gal. |

Essential Oils, Complete Line, Sold by the pound (8 lbs. to Gal.)

**PAILS & POTS**

| | | |
|---|---|---|
| 12 and 16 Qt. Galvanized | Doz. | Each |
| 4, 6 and 8 Qt. Paint Pots | Doz. | Each |
| 1, 2, 3, 4 and 6 Qt. Varnish Pots | Doz. | Each |
| Marking Pots with Ball | Doz. | Each |

**PLASTER OF PARIS**

| Bbl. | 25-lb. | 5-lb. | Less |
|---|---|---|---|

**PLASTIC WOOD** 12-lb. 1-lb.

**POLISH**

| | | | | |
|---|---|---|---|---|
| Metal | Gal. | Qt. | Pt. | ½-pt. |
| Waterproof Wax | Gal. | Qt. | Pt. | ½-pt. |
| Furniture "KLE-NU-POL" | Gal. | Qt. | Pt. | ½-pt. |

**PUMICE STONE**

| | | | | |
|---|---|---|---|---|
| Powder: Fine No. 3F, No. 2F, No. 00 | Bbl. | 100-lb. | Lb. | |
| Med. No. 0½, No. O, No. ½ | Bbl. | 100-lb. | Lb. | |
| Course No. ½, No. 1, No. 1½, No. 2 | Bbl. | 100-lb. | Lb. | |
| Lump | Bbl. | 100-lb. | Lb. | |
| Brick—Schumacher; Behlen | | | Lb. | |

**PUTTY**

| | | | | | |
|---|---|---|---|---|---|
| Linseed Oil | 100-lb. | 25-lb. | 12½-lb. | 5-lb. | 1-lb. |
| White Lead | 100-lb. | 25-lb. | 12½-lb. | 5-lb. | 1-lb. |
| Steel Sash | 100-lb. | 25-lb. | 12½-lb. | 5-lb. | 1-lb. |

Illustrated catalogue of complete finishing materials that will take care of your finishing requirements.

**H. Behlen & Bro., Inc., 10 Christopher St., N. Y. C. 14**

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*Write today for your free copy!*

☆

***This is a book you'll save and refer to often, just as others all over the country are doing! Send for your copy NOW!***

☆

- **A complete outline of the production of Pedigree Finishes**
- **Every page beautifully illustrated**
- **Written in simple language for fast reading**
- **Every finishing department foreman will want a copy**

The PRODUCT WITH A PEDIGREE — THE P·D·GEORGE CO.

**THE P. D. GEORGE CO.**
SAINT LOUIS, U. S. A.

now INFRA-RED plus

NEW ADVANCED

ROSS AIRAY OVENS

INFRA-RED RADIATION
PLUS AIR CIRCULATION } COMBINED AND CONTROLLED

For those who should use Infra-Red heating (and we don't say everyone should) here is Infra-Red at its best. Developed after more than a year of concentrated research and experimentation by the most competent drying engineers, the ROSS AIRAY System utilizes a scientific method for controlling radiant temperatures—(patent applied for)—that completely overcomes the objectionable features of premature attempts to achieve similar results. With entirely new and radically different control features and working characteristics, ROSS AIRAY OVENS will show substantially increased thermal efficiency in every case.

**NOTE THESE ADVANTAGES!**

Ambient temperature controlled by temperature of the goods.
Equalized temperatures preventing stratification in oven.
Heat losses greatly reduced.
Excellent rate of temperature rise maintained.
Positive control of air makeup and exhaust volumes.

Get the real facts on Infra-Red—its advantages and its limitations. Write for our new Bulletin No. 145. Laboratory testing facilities available.

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## *Back to Civilian Production*

**. . . . then it's finishes for protection, decoration and durability that will prove the deciding sales factor!**

Walker finishes, used extensiely in war-product finishing, embody a complete line that can be successfully applied to civilian products of all kinds.

Manufacturers seeking the latest in product finishes are invited to investigate Walker—

**PRIMERS** **SURFACERS**
**LACQUERS** **SYNTHETICS**
**WRINKLES**

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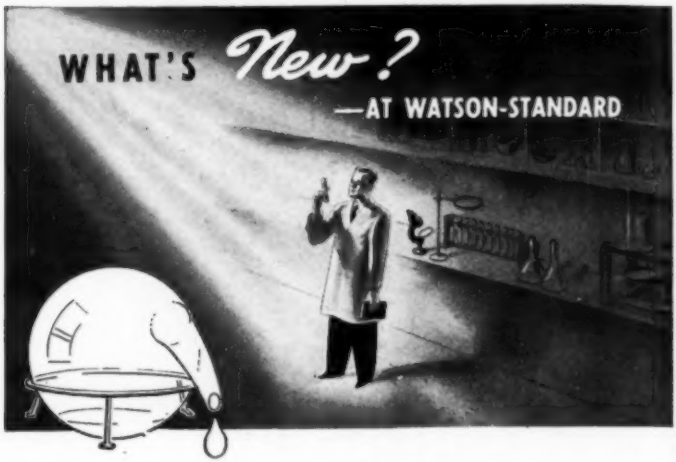


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**A Standard for the Industry**
**Now available under war restrictions**

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If you are designing a new product, no matter what the material may be, remember that Watson-Standard Laboratories have a special prescription finish for it.

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This is a proven fact: KOCH design gives you MORE WORK ROOM INSIDE THE OVEN in relation to floor space occupied—an important consideration in crowded plants.

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KOCH Truck Type Ovens are assembled from standard units on a production line basis, equipped to meet the user's exact needs and pretested before shipment. This means low cost, quick delivery and easy erection.

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# RUST RESISTANT COATINGS FOR *Steel Products*

BY JEROME M. BIALOSKY

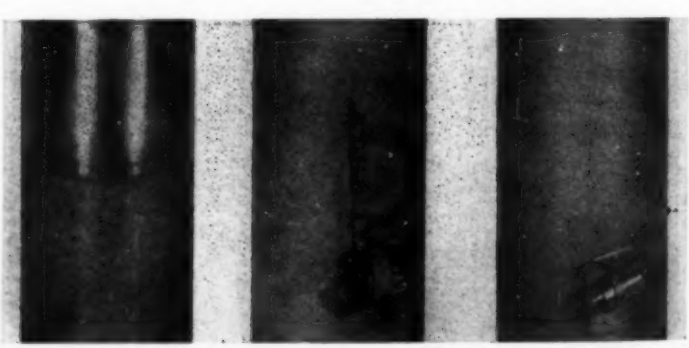
STEEL sheets, strips and wire are used as raw material for the manufacture of thousands of products which range from battleships to hairpins, and from armor plate to zithers. This multitude of uses has been the result of cooperative research carried on by steel producers and steel consumers. Final results are found in improved products with better appearance and at a lower cost to the ultimate consumer.

For many purposes it has been found economical to use a coated sheet as a raw material, rather than to coat the finished product. Galvanized sheet and wire, tin plate and terne plate sheets, are common everyday products of many steel producers. Clad steels, with a surface coating of 10% or more of copper, nickle or stainless steel, have found many uses where their higher costs are justified. Electroplated sheets and strips are available with nickle, copper or brass coatings.

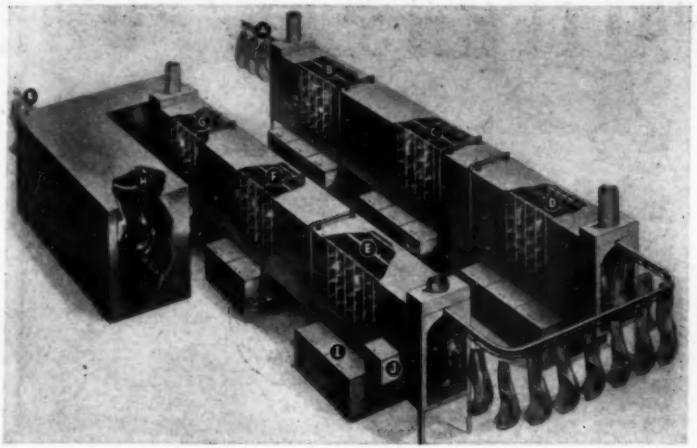
### Lacquer, Paint, Enamel Coatings Used on Steel Surfaces

In addition to these metallic coatings, chemical treatments and organic coatings are frequently supplied on steel mill products. These include lacquered blackplate, lacquered bonderized blackplate, enameled wire, painted corrugated sheets, etc.

For the majority of steel products, it is necessary to apply the finish after fabrication because of the manufacturing operations involved. This finishing may be done on sub-assemblies or on the completed article.



Sections of three 75-mm. smoke shells used in chemical warfare. Lower half of shell at left has been phosphate treated. Upper portion of this shell, untreated. Shell in middle picture was painted after degreasing. Shell on right was first treated and then painted. Note that the tape-test lifts paint from center shell, showing poor adhesion. Paint on shell at right adheres firmly; no paint comes off when tape is peeled from surface. Photo, Oakite Products Corp.



Showing typical layout of a conveyorized Spra-Bonderizing installation.

A—Products enter cleaning section.
B—Alkaline cleaning
C—Rinse . . . D—Rinse
E—Spra-Bonderizing section
F—Clear water rinse
G—Acidified Rinse
H—Drying oven
I—Tank, Spra-Bonderizing solution.
J—Tank for replenishing of Spra-Bonderizing solution.
K—Bonderized products leaving the drying oven ready for painting.

Illustration supplied through courtesy of the Parker Rust Proof Co.

The choice of finishing material is dependent upon the use of the article and costs. While parts of a typewriter or automobile could be chrome-plated for better wear resistance or appearance, we do not have completely chrome-plated typewriters or automobiles.

The use of organic coatings on steel has been accepted by manufacturers on the basis of suitable costs and ease of application, and has been accepted by consumers on the basis of satisfactory appearance and service.

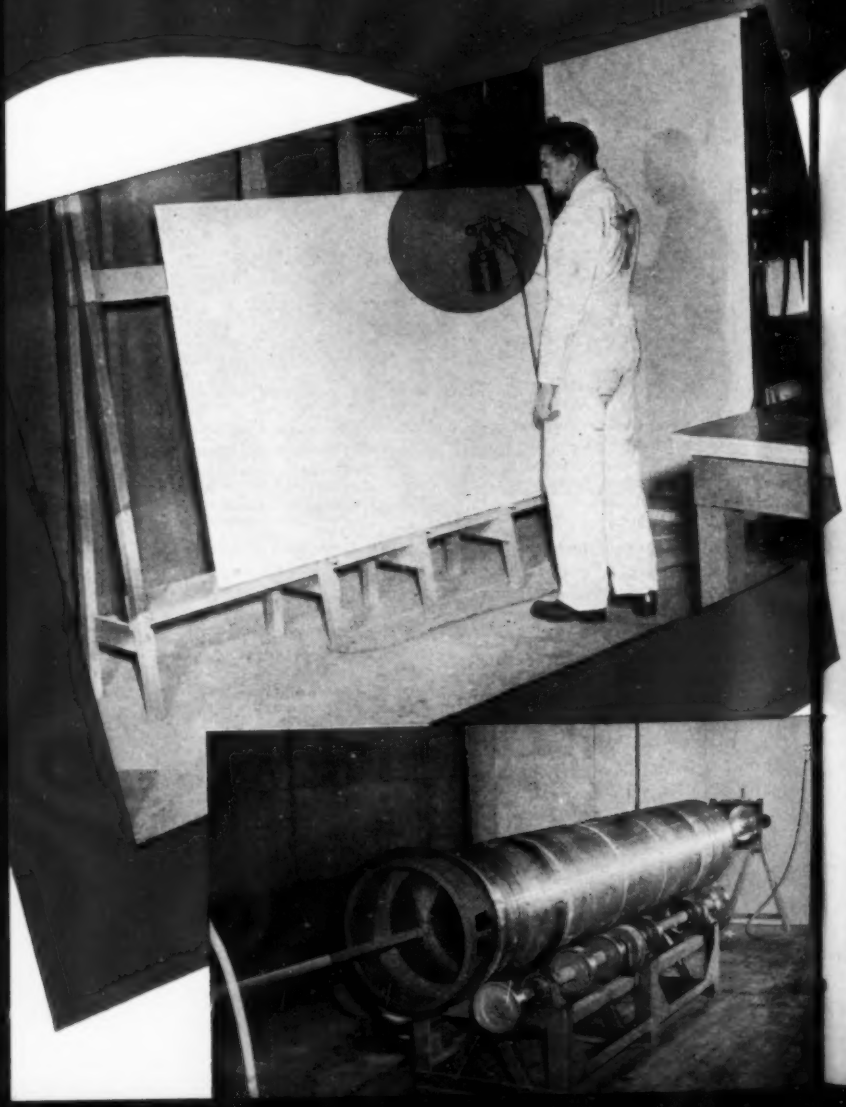
To obtain the best possible finish and service life with organic coatings, it has been found practical to treat the steel surfaces before applying these coatings. The reasons and methods are described in the following paragraphs.

### Paint Coatings Let In Some Moisture

All organic coatings are permeable to moisture to some degree. The extent varies with the type and proportion of pigments and vehicle, and the conditions of curing—that is, the drying time and temperature. This penetration of water or water vapor tends to lift the coating from the metal surface and form blisters. Adhesion of the coating to the metal resists this action. If the coating has good adhesion, the blisters

*(Continued on page 26)*

# PATTERNS *and* POWE *for*



*for Defeating the Axis*

# Sensitizing Templates for Bombers —Finishing Flasks for Torpedoes Demonstrate DeVilbiss Flexibility

Here are two ways that DeVilbiss Equipment is helping to crush Axis militarism with Allied Air and Sea Power.

Template photography, used in pattern-making for many Flying Fortress parts, has effected huge time-savings at Boeing Aircraft (left above). The outline of the pattern is photographically reproduced onto template metal sheets that have first been painted white and then coated with a sensitizing solution—both applied by DeVilbiss Spray Guns.

Extra fine paint protection is a prime requisite of torpedo flasks. So naturally the Newport Naval Torpedo Station uses DeVilbiss Equipment. Interior painting is automatic (left below)—the spray head on an extension arm moves through the revolving flask, quickly applying a thorough finish.

In meeting these and other war demands, DeVilbiss is setting the pattern for faster and better peacetime painting and coating operations. Ask the DeVilbiss man to tell you about them.

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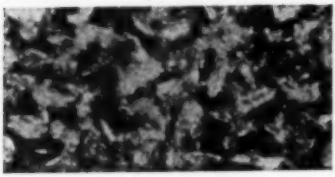


Photomicrograph of a piece of sheet steel after phosphate treatment, showing crystaline surface. This provides an excellent base for maximum paint adhesion. Photograph, courtesy of Parker Rust Proof Co.

will be very small, while a coating that has poor adhesion will allow the formation of large blisters or a peeling of the finish.

Another effect of moisture is under-film corrosion or rusting. Since the volume of the rust is greater than the original volume of the metal, the resultant tendency is to push the coating off the surface. Formation of rust is usually accompanied by an alkaline product, and most organic coatings have slight alkali resistance, thus presenting another source of failure.

### Surface Treatment to Prevent Rusting

Although black steel is the chief metal treated before coating, treatments have also been applied to galvanized and cadmium-plated steel with excellent results. The most widely used surface treatments are based on phosphoric acid or metal hydrogen phosphates, although oxalates and chromate-base materials have been developed.

The result of the surface treatment is to convert the steel surface into an insoluble insulating film which will retard corrosion and offer a good "tooth" for paint adhesion. The phosphate treatment produces an insoluble crystaline-coating on the steel surface, which meets these requirements.

### What Phosphate Coating Does; Methods of Application

It should be noted here that a phosphate coating, by itself, is of little value. *Its value lies in its ability to improve the service life of the finish applied over it.* There are three methods of obtaining phosphate coatings. The choice of method depends on the size and shape of the work, and the conditions existing in the user's plant.

The first method is the dip process. It is widely used for a great variety of shapes and sizes of work. This method has been adapted for use with tumbling barrels, for treatment of small parts such as nuts and bolts.

The second method is a spray or flow-coating operation in which the phosphate solutions are sprayed on the work in a manner similar to what is used in a power washer. It is frequently included as the final operation in a multiple-stage washing machine.

The third method of obtaining phosphate coatings is to brush or wipe the surfaces with suitable solutions. This method can be applied to structures that are too large to handle in the previously described methods. It can be used in the field on steel structures, bridges, trucks, and for similar applications. Stock that has rusted due to improper handling or storage can be readily reconditioned by this method.

It is obvious that these different applications will require different formulations for the dip, spray, wipe or brush treatments. Some of these materials may be applied and allowed to dry on the surface, while others require rinsing — and in some cases a chromic

acid rinse is recommended. The supplier's instructions should be followed exactly.

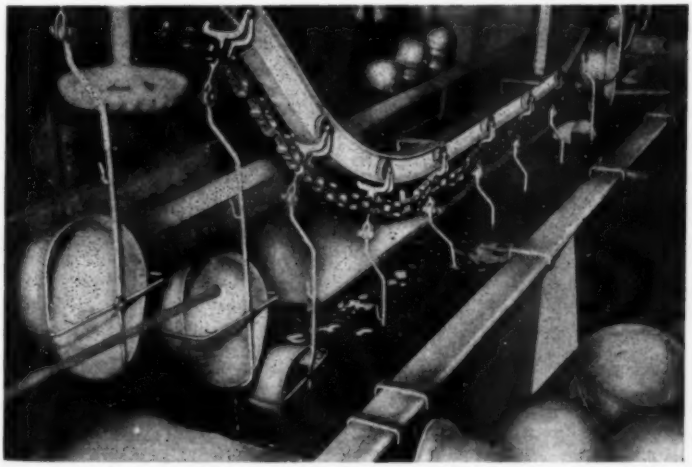
**Metal Must Be Cleaned Before Being Coated**

Prior to the application of any coating treatment it is essential to remove all grease, oil, drawing compounds and dirt from the metal surfaces. Although the surface treating compounds are acidic in nature and will remove rust, unless specifically designed for this purpose it is more economical to remove heavy mill scale by an acid pickle.

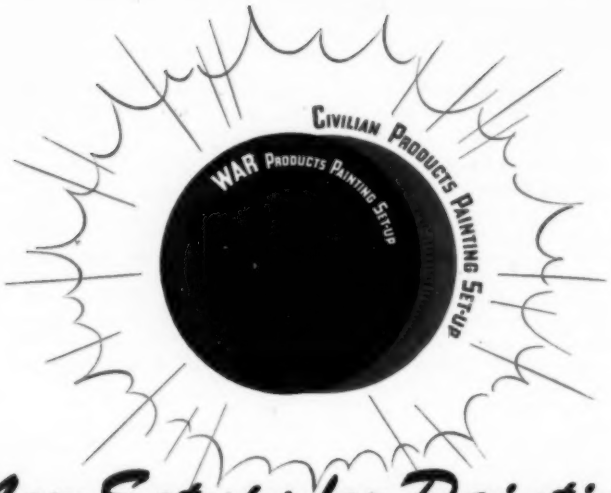
Following this precleaning, the phosphate solutions are applied for the time and temperature recommended by the manufacturer. After rinsing and drying, the organic coating should be applied as soon as possible. Complete instructions regarding the testing and maintenance of the solutions are available from the manufacturers and should be followed for continuous satisfaction.

Two types of phosphate treatment are available. The first type is primarily a base for paints. The preceding discussion has covered this type of treatment. The other treatment is a dip operation. It requires longer immersion time and produces a heavier, more absorbent surface. This treated surface is always waxed or oiled to obtain corrosion and wear resistance.

A number of Government specifications for metal parts require phosphate pretreatment. These include the specification covering the cleaning of aircraft metal surfaces prior to the application of an initial protective coating (Army Specification No. 98-20007); also, the general specification for finishing, treating and painting (Corps of Eng'nr's Spec. T1184E.



Conveyorized dip application of phosphate treatment on new steel helmets. Photograph furnished through courtesy of the American Chemical Paint Co.




# New Setups for Painting More Civilian Products

THE EDITOR HAS ASKED several well informed men for some intimate close-ups of what certain concerns plan or have already on the way in preparation for Reconversion; what different materials will be used in the construction of their new or improved products; what changes will be made in surface preparation, product painting or finishing, paint or varnish drying, decorative effects, conveyorization; what problems may develop, etc.

Their replies are of timely interest. What they say affords a welcome opportunity to check with what you may have in mind, or what others in your locality are planning or doing in preparation for partial or all-out reconversion to the manufacture of civilian products.

Let's start out with alert and aggressive Mr. A, an Eastern manufacturer of metal products. We quote him as follows:

"Every manufacturer is thinking about reconversion, the amount of thought depending upon how busy he may be on war work. Some of the companies who have been less successful in getting war work are now gaining an edge, in that their plans are more definite. In our own case we have an imposing list of things that are being done, but our progress (with good news coming from the war fronts) is not what it should be. We are working on our advertising, including a catalog, new dealers' aids, and advertising plan for new dealers, and some consumer advertising.

"Our outlook has spread from five states (prewar) to 13 states

**What some well-informed men say about present and future plans for changing industrial finishing departments over to production of civilian goods. What changes to look for in surface preparation, materials and equipment for new product painting and fast paint drying; new decorative color effects; more extensive use of quality protective coatings everywhere.**

(postwar). Dealers have been lined up in about half of these states. An industrial designer has been engaged who has drawn some pretty lines, and in a corner of the shop, now and then a man gets a breathing spell from the important work of the day to put in a few licks.

**New Factory Planned; More Modernization**

"A new building is being planned completely for postwar, as we have been very successful in sub-contracting during the war period and were able to get along in our present quarters. We still look forward to doing some postwar sub-contracting. . . .

"*Our principal changes are going to be in our finishing system. We expect to install new labor-saving equipment to do our metal cleaning, spraying and baking, together with means of keeping the product clean during processing. I would like to see some new products advertised so that we can get a better idea as to what is on the market, and satisfy ourselves that we have the latest things.* We also expect to augment some of our fabricating equipment.

"As a postwar job we are lining up to improve our production planning and cost system, as the job of getting started gives one an opportunity to really set up to do things in a better way.

**Start with Prewar Materials and Add Some New Ones**

"We expect, basically, to start off with the same types of materials we used before the war. However, we are introducing some of the new materials available including new metals, new woods, plastics and glass. The use of this new material is not radical but is more in order to establish a trend; and should the use of these new products become more widespread, our use of them would also be increased."

What Mr. A has stated about being interested in new equipment for his finishing department is typical of what a number of other executives and production men have told us.

* * *

MR. B, whose letter follows, is an industrial engineer in Michigan. The type of work he does brings him in contact with a variety of large manufacturers and, as he says, "this naturally involves discussing postwar finishing plans."

**Startlingly New Materials Not Expected Soon**

"I believe that consumers will find relatively few startlingly new things on the market immediately after production of civilian goods is resumed. Many new things have been conceived but they will not be available until later—some of

them much later. In so far as paint is concerned, most industries will start production with exactly the same type they were using before the war—that is if they can get it. The main reason for this is the necessity for turning out the maximum volume of goods as speedily as possible. In most cases the motive is competitive. Everybody wants to get on the market 'fust with the most.' Under these circumstances production managers don't want to risk production delays incident to the use of new types of paint.

*"Modernization of finishing processes is receiving a great deal of attention. Experience with Government specified finishing procedures has emphasized the value of adequate surface preparation. Improved methods of surface cleaning will be more generally adopted in the postwar period.*

**Water-wash Spray Booths; Automatic Spraying**

"The wide use of the highly pigmented Government specification paints has stimulated the adoption of more water-wash spray booths. Here again production men have learned by experience the advantages of this type of booth. The features of the water-wash booth which have earned it more favorable consideration are:

"1) Better housekeeping and improved working conditions. resulting in uniformly better work.

"2) Lower maintenance costs.

"3) Operating economy, derived by recovery of paint overspray.

"The necessity of producing a great volume of war materials in double-quick time has also promoted wider application of automatic spraying, faster drying, and conveyorization. In short, the impact of war production had the effect of awakening industry to the realization that finishing procedures were more or less antiquated. Most production men with whom I have discussed postwar operations have definite plans to modernize their finishing systems, particularly where it will decrease labor and material costs.

"The buying public will be disappointed when civilian goods first re-appear on the market. The quality will, in some cases, be inferior to prewar standards, and the prices will be substantially higher. The unfavorable public reaction, coupled with the competitive factor, emphasizes the necessity of taking advantage of all possible operating economies to offset the more or less inevitably higher material and labor costs and taxes. In this connection . . . I believe that the recovery of paint overspray will be more widely practiced after the war than it was before the war.

**Bright Decorative Colors Will Be in Demand**

"As far as decorative effects are concerned, the trend of thought is to anticipate a demand for brighter colors. This is a natural reaction from the drab wartime surroundings. Service men in particular will try to get as far away as possible from olive drab, navy blue, and forest green."

* * *

BEFORE the war, Mr. C, whose letter follows, had an important position with a large manufacturer of paints, varnishes and lacquers. For almost three years he has been on Government work in Washington. The following paragraphs are characteristic of his systematic and orderly presentation of facts—on the Reconversion subject, as he sees it:

"Prices: Some excellent specification materials have had widespread use, with competition very keen; in fact, some of the prices are ruinous. Many users will want to continue to use the same finishes for civilian production, with a modification or two, and will expect little increase in price. This may mean that the industrial finish manufacturers may have to offer more standard finishes, which they can produce in large volume for many customers, in order to meet war established price levels—this rather than so much emphasis on 'tailor made' products.

**Plastics; Synthetic Resins; Pre-coated Metal Strips**

"Sheet Plastics: Furniture manufacturers who make their own veneered panels should find it desirable, in many cases, to work out a process wherein they will finish up with sheet plastic for the top layer, at least for the flat top surfaces of tables, buffets, etc.

"Synthetic Resins: You may have data on the tremendous increase in production of these resins. This should make them cheaper (relatively). Cheaper synthetics would make economical a more widespread use of infra-red baking.

"Precoated metal strip: After the war, with improved coatings to take more severe forming, there should be a great increase in this method of production.

"*Mechanization: Manufacturers who have been forced into conveyorization, infra-red baking, automatic spraying, etc., will, in many cases, have this equipment available for civilian production and will know the economies of its use.* Much of it may be available as surplus equipment from war plants. It's hard to tell what the effect of such surpluses may have on the new equipment business, but there is no doubt that the war has done a great promotion job for the industry. I believe the immediate after-the-war demand will be great in spite of equipment from dismantled war plants.

**Railroad Paint Jobs; Why Not Baked Enamels?**

"Railroad finishes: Many railroads have paid for and received 'junk' for maintenance of equipment. In fact most roads are not willing to pay for good stuff. There is a big field for high grade material, also for high grade maintenance methods in conjunction with the high grade finishes. For instance, new streamline cars run $80,000, $90,000 to $100,000 each. The exteriors of these cars should be subject to maintenance just the same as the baked finish on a Plymouth, Ford or Chevie. *(to p. 32)*

Avoid storing drums of material outside where the contents are subject to wide variations in temperature.

"There is no reason why new steel cars should not be bake finished, and I mean not only passenger cars, but steel freight cars. With such a finish, and given proper mechanized maintenance methods, *enameled passenger cars would present a better day-in and day-out appearance than stainless steel equipment; would be cheaper; would be distinctive of the road, and would always assure uniform assembly of cars into a train.* Most of these objectives could be attained by proper maintenance methods with present air-dry synthetics, but few roads had these methods even when plenty of labor was available.

"Wider use of 'flame priming' and sand-blasting, roto-blasting, and similar methods of surface preparation warrant the use of higher-grade primers and finish costs, plus the durability-improving powers of baking the finish."

* * *

We believe that the foregoing ideas, suggestions and forecasts point up certain important phases of product-painting departments and practices to come in the post-war industrial picture. There is much more to be added. It will be presented as it becomes available and as reconversion develops. The Editor will welcome more letters on this timely and vitally important subject.

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## Keep Your Paint Equipment Clean

NOT the least important in producing a clean-finished product is cleanliness of the equipment used in the finishing department. The grit and dirt on freshly sprayed or dipped parts can often be traced to the dirt chipped off hooks, pails, and tanks used in the finishing process.

Hooks that suspend the parts from our conveyors are stripped of paint each week. Our dip tanks are drained, dismantled and cleaned every two weeks. Miscellaneous pails, buckets, etc., are cleaned when necessary, usually every three or four days.

How do we clean these parts? We have a large tank made of mild steel. In this tank are steam coils to heat the liquid used for cleaning. To each gallon of water put in the tank, we add 3-oz. of caustic soda and 3-oz. of tri-sodium phosphate. We fill the tank with this mixture and it is brought to almost a boil by the heat of steam coils.

The parts are put into the tank separately or, in the case of hooks, several are placed in a wire basket and lowered into the stripping tank. The length of time the parts must remain in the tank to strip them clean is determined by the amount of paint accumulation and its hardness. Anywhere from one hour, for the lightly coated hooks, up to two days for the dip tanks will do the job satisfactorily.

After the waste material has been completely removed from the parts, they must be rinsed thoroughly to remove all traces of the caustic solution. This is especially important on pails and tanks, as even a small portion of the caustic can throw a dip tank full of varnish out of solution. Gloves must be worn by the operator to protect his hands, even his arms, against burns.

A clean product is more than worth the effort of checking the cleanliness of the department.—M. S. K.

# RUST !!

## Prevention or Removal

## In the Humid Months of Summer and Early Fall—the Rusty Season—the Rust Problem Becomes Acute

Rust, especially during rainy, humid weather, often becomes so troublesome as to seriously interfere with the steady flow of production. Rust can disrupt the whole production line and cause serious bottlenecks unless steps are taken to prevent or remove it during fabrication. With ACP Deoxidines rust removal becomes a simple matter of routine.

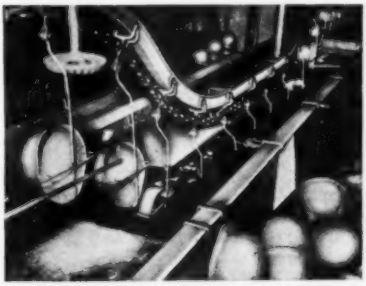
### RUST REMOVAL

There are types of Deoxidine adapted for use in large, continuous, mechanized production in power spray washers that remove both rust and oil. Other types are adapted to immersion processes that may be mechanized or manually operated to suit production needs. There are still other types for hand wiping processes to remove occasional light rust that otherwise would require slower and more laborious mechanical operations. These and other Deoxidines not only clean the metal—removing rust and destroying or inhibiting rust producers—they also properly condition it for painting.

*A—Spray types of Deoxidine are adapted to the cleaning and processing of large surfaces in quantity production.*

### RUST PREVENTION

Peroline, a combined chemical and oil, not only provides a thin oil coating, effective in retarding rust, but it is unique in that it removes blushes of rust and marks from sweaty hands and destroys visible or invisible chemicals that would develop rust under conventional preventing coatings. While the amount of rust removal with Peroline is limited, its ability to remove thin coatings will often eliminate a separate cleaning or salvaging operation.



*B—An immersion type of Deoxidine is well suited to the rapid cleaning of helmets with mechanized equipment.*

Today, Deoxidine, Peroline and other ACP Chemicals are aiding in the production of many war essentials. They are aiding in salvaging various items which, due to improper cleaning or lack of proper protection, have become rusted during fabrication and storage. They are helping to insure satisfactory finishes and are minimizing rejections in the production of many vital war supplies including Shells, Rockets, Ammunition Containers, Automotive Equipment (jeeps, tanks, trucks, etc.), Marine Equipment, Aircraft and Aircraft Parts, Signal Corps Equipment and hundreds of miscellaneous components.

Further information on rust removal or prevention and Service Data Sheets on Deoxidine and Peroline may be obtained by addressing the American Chemical Paint Company, Ambler B-9, Penna.

*Here is a short article on the characteristics of liquid metal cleaners. There is nothing revolutionary in this article, yet I know from experience that too many people regard a metal cleaner as a metal cleaner and let it go at that. A slight survey of their cleaning needs, coupled with some idea of what various cleaners will accomplish, would greatly aid them in making an intelligent selection.—*

G. C. Close

## WHAT TO CONSIDER WHEN CHOOSING THE

# Right Metal Cleaner

THE multiplicity of metal cleaners available and the claims made for each tends to create more or less confusion in the mind of the prospective user. The only fact vividly clear to the finish engineer is that *the cleaner must produce a chemically clean surface on which to apply finishing materials, and must accomplish this result at a moderate unit cost.*

The importance of metal cleaning is never argued by the experienced finish man. He is aware that a dirty surface will not only affect the adhesion of finish coats, but will be conducive to electrolytic action, between the ingredients of the finish material and the basis metal, that will endanger the entire finish system.

It therefore becomes necessary to establish a theoretical "yardstick" by which the finish engineer may gauge cleaning requirements and balance them against the properties of the various cleaners available.

### What Soils Metal Surfaces

The types of dirt common to most manufacturing operations will fall under one of four general categories. There are: 1) the mineral oils; 2) the animal or vegetable oils; 3) combinations of mineral and animal or vegetable oils; and 4) insoluble matter either alone or in combination with one or more of the oils mentioned above. Any one alone, or a combination of the types of dirt just enumerated will require a specific cleaning process, with the cleaner modified to the type of soil involved.

A brief survey of plant storage and manufacturing practices will usually indicate offhand the types of dirt that will be encountered. As a specific example, many companies employ fish oil as a preservative for metallic raw stock. Subsequent machining or forming operations may involve the use of a mineral type oil. Under such conditions, it is immediately evident that both animal and mineral oils will have to be removed during the final cleaning operation. The combination of oils will require an entirely different type of cleaner than if either were present alone.

Mineral oils are probably the most common type of soil encountered. Such oils are removed by

# When it comes to Removing *consult* WILSON-IMPERIAL

## *Makers of the most widely used paint removers in America*

You will save valuable shop time by using a remover suited to the type of finish to be stripped. With our 30 years' experience in supplying furniture manufacturers and other industrial concerns, we have developed numerous removers suited to paint, varnish, lacquer, enamel, shellac and synthetic finishes. We have also formulated a remover that eliminates fire risk and that requires no wash-up—our SAF-TE Remover.

If you will tell us the type of finish you wish to remove, we will gladly advise the proper procedure and the remover to use.

*Our removers are sold by leading distributors of paint products throughout the country.*

**WILSON-IMPERIAL COMPANY**

**Dept. E-94** **115 Chestnut Street, Newark 5, N. J.**

emulsification [wherein particles or globules of the oil become suspended within the cleaning liquid and are carried away by and with it]. This is a physical rather than a chemical action, and will not affect any animal or vegetable oils that happen to be present. Conversely, animal or vegetable oils are removed by *saponification. This is a chemical reaction during which the oils are converted into water-soluble alkaline soaps.* A cleaner compound for saponification purposes only will have very little effect on mineral oils present.

### Mineral, Animal and Vegetable Oils Differ

The fact that mineral oils and animal or vegetable oils are removed by entirely different methods establishes, without alternative, the type of cleaner that must be used when both oils are present. The cleaner must both emulsify and saponify. Preponderance of either action will depend upon the ratio of oils present, and is best determined by carefully conducted production runs. A cleaner with predominant emulsifying characteristics for use when the major portion of the soil is composed of animal or vegetable oils will be inefficient.

Insoluble matter such as heat-treat scale, in combination with one of the oils previously mentioned, presents a slightly different problem. The insoluble matter will have to be removed either by hand scrubbing, or by use of a high-pressure washing machine. (In this article I am not considering mechanical methods of cleaning, such as sand-blasting.) The solution employed, either for hand scrubbing or in the washing machine, should be a cleaner properly blended to accomplish emulsification, saponification, or both, as required to remove the oils that are present.

### Light-Duty, Medium-Duty and Heavy-Duty Cleaners

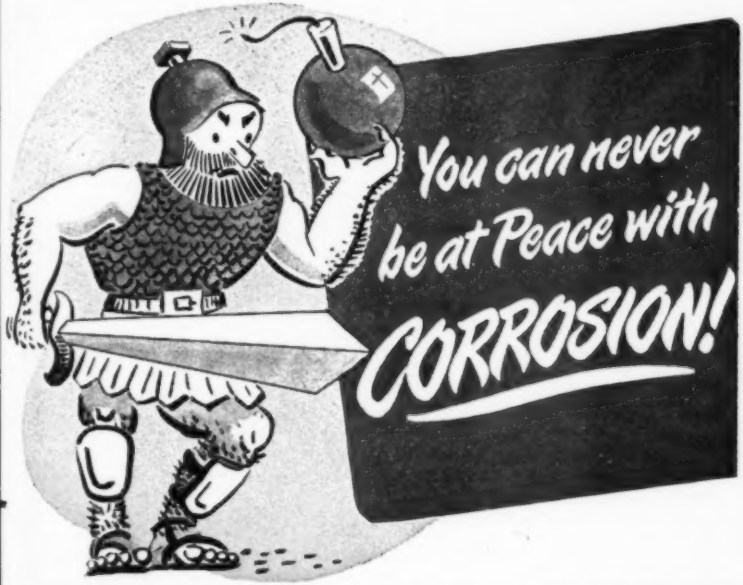
To get optimum cleaning results, something more than establishment of the required type of cleaner is necessary. The finish engineer responsible for procuring cleaning materials should be familiar with the trade terms used to designate different types of cleaners, as well as with cleaner composition and the effect that various cleaner components have on the cleaning job.

Generally speaking, "light-duty" cleaners clean almost entirely by emulsification. They are not caustic, and are employed principally for cleaning the light alloys, especially aluminum, and for steel when the amount of soil involved is slight and is neither of animal or vegetable oil composition. Because light-duty cleaners are harmless to either hands or clothing, they are used extensively for maintenance cleaning.

The "medium-duty" cleaners are mediumly caustic, and they clean by both emulsification and saponification. They are used with either ferrous (containing iron) or nonferrous (containing no iron) alloys, and perform efficiently when the amount of animal or vegetable oils present is not excessive. This is the most universally employed grade of cleaner for general work.

The "heavy-duty" cleaners are highly caustic and clean almost entirely by saponification. They are for use with ferrous metals only, and will attack and etch the lighter alloys. Care must be used in handling this type of cleaner, as it is injurious upon contact with skin.

*Two requisites of any cleaner are that it be free-rinsing and exhibit good wetting characteristics.*




● Armor-like protection against corrosion, fumes, moisture is given by the layer-after-layer of aluminum flakes that an application of Permite Ready-Mixed Aluminum Paint provides. No tedious, wasteful mixing, for Permite comes ready to open and use.

While wartime requirements still restrict the supply of Permite Aluminum Paint, a complete line for all interior, exterior and product finishing requirements will be available for the expanded uses which peace will bring.

For wartime product finishing problems the experience of our technical staff is at your service in supplying Permite Industrial Finishes formulated to government specifications. Included are clear and colored lacquers, zinc chromate primers, enamels, mixing varnishes, rust inhibitors, camouflage paints. Quotations submitted promptly upon request.

**ALUMINUM INDUSTRIES, Inc., Cincinnati 25, Ohio**
***Permite Paint Division***

**PERMITE READY MIXED ALUMINUM PAINTS**

*The free-rinsing qualities of a cleaner will depend largely upon its composition. Many ingredients that impart an advantage to a cleaner will detract from its value when used in too great a proportion. Though the cleaning operation may be expedited by the use of excessive amounts of such chemicals, the result will not be a chemically clean surface due to poor rinsing characteristics.*

**Cleaner Must Have Free Rinsing Characteristics**

Chemicals that will detract from the free-rinsing properties of a cleaner, when used in too great amount, are rosin in either powdered form or in the form of a rosinate, sodium silicate of either the meta, sesqui, or ortho variety, high titer soaps, and various bentonite clays. As previously indicated, such chemicals are advantageous up to a certain point. Beyond this point they may expedite cleaning, but will seriously affect free-rinsing characteristics. When too great a speed is claimed of a cleaner, excessive incorporation of one of the above named chemicals may be logically suspected.

The final step in selecting a cleaner will be actual service tests. Here a word of warning is not amiss. Seldom if ever is it possible to duplicate production cleaning in the laboratory. Though the laboratory is convenient for chemical analysis of the cleaning solution, for determining pH concentrations, etc., final word should be withheld until the cleaner has been given a shop trial. Any cleaner worthy of consideration is worthy of the slight additional expense involved in testing it under actual working conditions. By following this rule many expensive mistakes will be avoided.

## Individual Service in Custom-Built Finishes

Inviting long distance calls from plants needing assistance with their finishing problems, Standard Industrial Products, Inc., Evansville, Ind., has inaugurated an individual service feature in connection with the marketing of "Wearmaster" custom-built industrial finishes.

"Our staff of finishing specialists and 'trouble-shooters' has been made available for direct phone consultation on all industrial finishing problems," the firm states. "While our field men cover their territories as well as possible, the manpower and transportation situations make it necessary to supplement their work by more direct connection with the home office.

"For this reason we invite finishers who may be having difficulty with any of their finishes—or who want to improve results they are getting—to call us up, at any time. They will talk directly with one of our practical finishing specialistts, who will give them the benefit of his wide experience in solving finishing problems. There is no charge or obligation for this service."

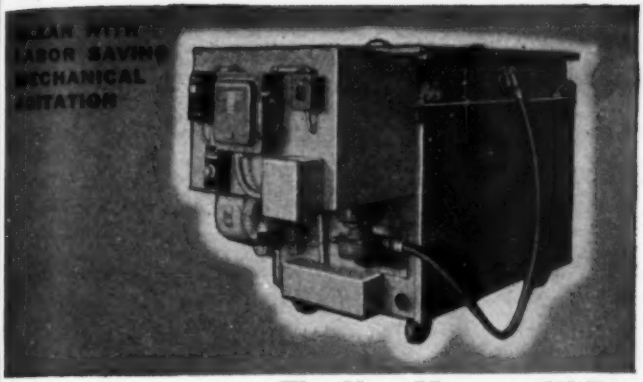
## Fletcher Becomes President of J. O. Ross Engineering

S. W. Fletcher, for many years Executive Vice-President of the J. O. Ross Engineering Corp., has been elected President of that company

S. W. Fletcher, now President of J. O. Ross Engineering Corp., in New York.

and will continue to make his headquarters in New York. A. E. Montgomery will continue as Vice-President of the company, with his headquarters in Chicago.

Announcement has also been made of the following other officers: Vice-Presidents, H. G. Rappolt and F. W. Partsch; treasurer, J. A. Ronder; secretary, R. W. Grott.




## The New Magnus All-Purpose Portable Metal Cleaning Machine

Cleans with agitation of the parts *in* the cleaning solution. Work is given thorough "swishing" contact with the solution assured by fast up and down motion. Made in a wide range of sizes, this machine can be used with any cleaning material and on any metal.

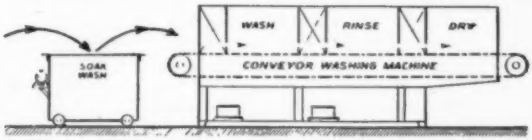
It is particularly valuable when used with the Magnus Emulso-Dip method for precleaning, where thorough removal of chips, abrasive particles is essential.

**WRITE FOR THIS BULLETIN**

*Bulletin 3600 covers the principles, capacities, dimensions and applications of this unique machine. You will find it well worth a careful study.*

**IN CLEANING BEFORE PLATING, FOR EXAMPLE**

Vastly improved cleaning quality is assured when one of these machines is used with Magnus Emulso-Dip solution prior to regular alkaline cleaning in a washing machine, as indicated in the sketch below.




The Magnus All-Purpose Machine is available in a wide range of capacities at prices from $300 to $800 per unit, depending on size and type of heating provided. In many cases, where cold cleaning solutions are used, no heating is necessary.

Magnus

MAGNUS CHEMICAL COMPANY · 40 SOUTH AVENUE · GARWOOD, N. J.

CLEANERS·METHODS·MACHINES

# We Changed Our Setup to Paint Shell Cases

**BY DALE W. MUSSELMAN**
**Finishing Foreman**
**The Gerstenslager Co.**

AFTER completion of the last unit of our Cargo Trailer Contract, we immediately switched our attention to the many problems presented by our new Government Contract for 105-mm. steel shell cases. The need for the cases was urgent and the time allowed for conversion was limited.

Our biggest problem was to convert our overhead conveyor line to this new item with the least number of changes possible. Changes had to be made in our cleaning, painting and drying equipment, but first we had to devise suitable hangers for the various parts comprising a unit, which would work effectively in each operation.

The unit itself consists of a steel tube approximately 34¾-in. in length, and 6-in. in diameter. The bottom of the case is closed by a recessed plate, seam-welded into place. The depth of this depression is about ¾-in. The opposite end of the tube is reduced in a diameter to 5½-in., and around this small diameter is spot welded a locking ring. This locking ring securely holds the outer cap which is 4-in. long, and 6-in. in diameter. A pressure plate containing a rubber gasket fits into the outer cap. The case is made air-tight and water-tight by slipping the outer cap over the locking ring, and tightening the pressure plate down on the rim of the case, by turning a handle bolt in the outer cap. Inside the tube are two circular guide rings, fastened to the tube by an outward dimpling operation.

### Hangers to Carry Shell Cases Through Operations

Many ideas for suitable hangers were presented and experimented with. Finally hangers designed by Mr. Ernest P. Martin, president of the company, were adopted. The large hanger holds two of the cases in a rigid vertical position, with the bottom or closed end up and the open end down. The hanger is so hinged that the closed end of the shell case can be tipped lower than the open end, at points where this is necessary. A small hanger holds two of the outer caps, and also two pressure plates, somewhat above the level of the top of the shell case, on the conveyor line. The hangers are correctly spaced, and so adjusted on the line, that none of the parts touch or interfere with each other at any point along the line.

### Metal-Cleaning Set-up; Dip-Painting Job

In our large automatic spray-type of cleaner the spray nozzles were enlarged and placed in many different positions so that each part, including the almost inac-

# HAMMERTONE

## The Finish with the Beauty of BEATEN METAL

**for YOUR POST-WAR PRODUCTS**

HAMMERTONE simulates beaten metalwork so closely you have to feel it to tell the difference. It bakes to a uniformly lustrous, tough and durable finish. It is easily applied even by inexperienced spray men. ☆ This new M & W finish will be available in silver, copper and other colors for use on all types of metal and molded bakelite post-war products. ☆ Write for full information and also ask for our booklet, "Information on U. S. Government Specification Finishes," containing up-to-the-minute lists of specifications and the M & W finishes which meet them.

M & W

**MAAS & WALDSTEIN COMPANY, NEWARK, N. J.**

PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALTY FINISHES FOR ALL PURPOSES

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Here you see shell cases entering dip tank, closed ends first. They are held by hangers attached to an overhead chain conveyor line.

cessible areas, would be completely drenched by the cleaning solutions. The shell cases enter the cleaning process shortly after being placed on the conveyor line. First they pass through a caustic tank which removes oil, grease, and foreign substances. Then they receive a warm water rinse, and finally an etching solution which also leaves a protective iron phosphate coating on all surfaces. Next, they pass through a series of air jets, which removes all excess solutions except in the recessed (closed) end of the shell case. A special baffle was built in the cleaner which tips the case to allow the solution that gathers in the recessed end to flow out. The cleaned shell cases pass through a gas oven at a temperature of 350°F. and are thoroughly dried and prepared for painting.

At first the painting problem seemed to be a very difficult job. While we had an excellent spray set-up, it seemed to be almost an impossibility to reach all of the recesses and hidden spots on the units (underneath guide rings and inside the locking ring) that Army Specifications demanded. Our only alternative seemed to be a dipping procedure.

**Details of Dip Tank**

We designed and built our own dip tank after many experiments and experiences. The tank and the conveyor line had to be engineered almost perfectly, and this objective was finally accomplished. One of our former color spray booths offered the best location for the dip tank, to make the least change in the line. Its position also allowed a 15-minute interval of travel for cooling time—from the time shell cases left the dry-off oven until they entered the paint.

Our dip tank is about 18-ft. in length, 40-in. wide, and 22-in. deep. The paint level is kept 3-in. below the top of the tank. Capacity of the tank is 360 gallons. The material used is Government Spec. No. 3-181 Class No.2 Olive Drab Dipping Enamel. The shell cases receive one coat of this material, which must cover all surfaces of the unit (both outside and inside) with a minimum thickness of .7 of a mil.

At the point of entrance to the tank, the shell cases are guided by a fork at the bottom of the hanger, onto a single track which extends lengthwise through the center of the tank. The track is raised about 3-in. above the bottom to keep the cases clear of any sludge or heavy pigment that may accumulate there. The cases are gradually tipped by the coordination of the overhead conveyor line and the tank itself, so that the recessed or closed end of each case enters the paint first at a lower level than the open end. This angle is maintained until the inside of the case has been completely sub-

# STRIPS OFF Dirty Film

## SUN SPIRITS

***speeds up drying rate . . . eliminates greasy film on parts***

Army Ordnance specifications are tough . . . and they should be . . . because victory depends on the supplies and materials going to our fighting men. That's why one plant, packaging war parts, decided to change solvents in their metal cleaning operations.

**Delays in production** had caused a sharp decline in the number of pieces packed per day. Troublesome oily films slowed up progress . . . necessitated long intervals of drying time between the washing and rust preventative applications. They were not able to meet required standards.

**Troubles were eliminated,** after switching to Sun Mineral Spirits. Its high volatility speeded up the rate of drying . . . stepped up production and output. Oily films are now nonexistant . . . parts are cleaned thoroughly and efficiently.

**You can profit,** likewise, by cleaning with Sun Spirits in your plant. It's fast . . . requires no mixing or heating . . . is always ready for instant use. For more factual information, write for your free copy of "Case Histories of Cleaning Up War Parts."

**SUN OIL COMPANY • Philadelphia 3, Pa.**

Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

SUNOCO

**SUN INDUSTRIAL PRODUCTS**

*HELPING INDUSTRY HELP AMERICA*

merged and filled with paint. The conveyor line then takes a slow upward turn, bringing the cases out of the paint at a sharp angle, allowing most of the excess paint left in the recessed end to pour out. At this point, the small excess of paint left in the recess is removed by an operator with a small brush. As the shell cases emerge from the tank they begin to resume their perpendicular position and they release the temporarily entrapped paint back into the tank.

**Draining Dipped Work; Fire Hazard Problem**

The dip-coated work then passes over a series of drainboards for about 100-ft. The first drainboard is about 15-ft. in length, and drains directly back into the dip tank. In the bottom of the tank a rotating agitator, protected by a grillework, keeps the paint in slow but constant motion, maintaining a uniform viscosity throughout the tank. The condition of the paint requires very close checking at regular intervals to maintain its correct viscosity, so that the specified film thickness will always be adhered to. Viscosity is checked from time to time by using a No.2 Ford viscosity cup, and the Baume scale for specific gravity, with allowances made for any change in the temperature.

Due to the fire hazard produced by our dipping set-up, satisfactory and efficient fire protection was needed. We converted one of our former spraying pits into an emergency tank under the floor level. In case of fire, we can quickly empty the dip tank into this auxiliary tank by releasing a valve located at a distance from the dip room. The tank is also protected by our sprinkler system and carbon dioxide fire extinguishers. Fresh air is constantly furnished to the dip room by an air-conditioning unit, and fumes are removed by suitable exhaust fans.

**Storage, Mixing, Straining of Paint; Cleaning Hangers**

Our paints and solvents are stored in a mixing room at a distance from the shop. We mix the paint in our former 60-gallon pressure spray tanks, and also supply the dip tank from these portable tanks. The paint is carefully strained as it is mixed so it is supplied clean to the tank as needed. We drain the dip tank at least once a week from a valve in the bottom of the tank, and thoroughly clean it. All the paint is carefully re-strained before being returned to the tank. The hangers also accumulate a great amount of paint. We clean them by immersion in a hot tank of enamel stripper for a few hours, and then follow with a steam bath.

**Removal of "Tears" by Electrostatic Detearing**

After the dip-coated shell cases have been allowed to drain over the usual type of gravity drain for a suitable period, they are carried over grids of an electrostatic detearing unit where the excess "tears" of material clinging to the lower edges of their surfaces are removed. This electrical detearing equipment includes three conducting grids which are insulated from ground and maintained at a high static potential by being connected to a suitable source. These grids are properly spaced along the conveyor so the shell cases and other parts are carried over them at a time in the flow-drying cycle when the flow-down of paint has substantially ceased. As the grounded shell cases pass over the grids a

*(Continued on page 48)*

# When you have a finishing problem

## ...here's the man who can help you

He's backed by an organization that has specialized in individualized finishes for more than three-quarters of a century. And he offers facilities that are producing more and more protective coatings for war all the time ... He's the Murphy service-salesman—technically trained, experienced, resourceful, and up-to-the-minute on modern finishing methods. Why not call him in now? Just phone or drop us a line.

**He has wide experience in war-time finishing for such products as**

- Airplanes
- Range-finders
- Optical Apparatus
- X-Ray Equipment
- Gliders
- Ration Cans
- Autogiros
- Ammunition Sets
- Plywood Assemblies
- High Precision Instruments
- Gunfire Controls
- Shells
- Gunstocks
- Gas Masks
- Ammunition
- Machine Tools
- Distillation Units
- Tanks—Jeeps—Peeps
- Aircraft Heater Units
- Ammunition Carts
- Windshield Wiper Units
- Motors and Generators
- Fans, Blowers, Exhausts
- Helicopters
- Machine-gun Mounts
- Airplane Propellers
- Navy Bicycles
- Power Cranes, Shovels
- Hospital Equipment
- Dredging Equipment
- Anti-aircraft Searchlights
- Radio Units
- Army Locomotives
- Commando Ramps

**MURPHY VARNISH COMPANY**

NEWARK SAN FRANCISCO CHICAGO

# MURPHY *Protective* COATINGS

## Another complete BINKS spray painting system

Air, when ladened with paint fumes, is a definite hazard . . . both health and fire. In the modern Franklin Plant of the Chicago Pneumatic Tool Company, where the well-known Chicago Pneumatic Portable Compressors get their protective coat, a Binks Spray Painting System applies the finish and washes the paint out of the air after it has used it. This is done with the large down-draft water wash spray booth shown here. The air enters the booth through the open top and is drawn down through the grills in the floor. Below the floor the air is so thoroughly washed that it can be vented back into the room from which it was originally taken.

If you have a finishing problem, remember: NO SPRAY PAINTING JOB IS TOO BIG OR TOO SMALL FOR BINKS EQUIPMENT.

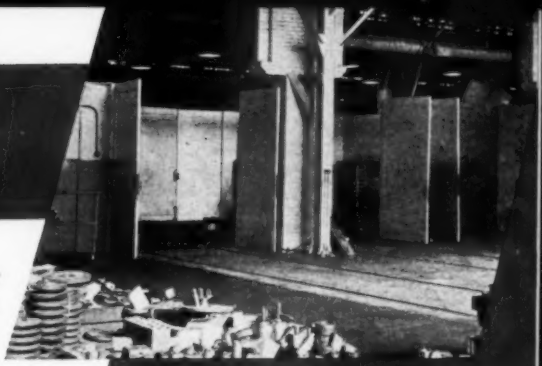
ARMY NAVY

BINKS MANUFACTURING COMPANY

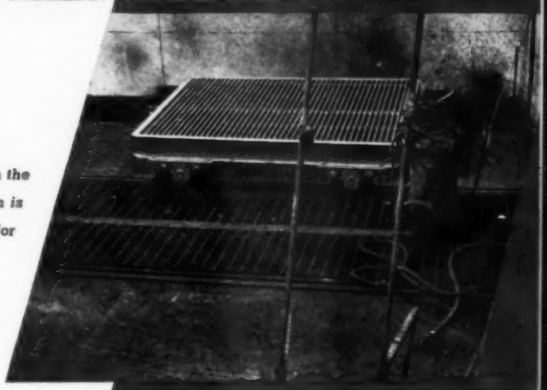
3114-40 CARROLL AVENUE • CHICAGO 12, ILLINOIS

NEW YORK • DETROIT • SAN FRANCISCO • PHILADELPHIA • CLEVELAND • PITTSBURGH

# of AIR



*The units to be finished enter the spray booth through doors on one side and leave through doors on the other.*



*The grilled floor through which the paint ladened air is withdrawn is shown here. The truck is for heavy units without wheels.*

*A Chicago Pneumatic Portable Compressor in the field. On jobs like this a good finish is needed protection against rust and corrosion.*

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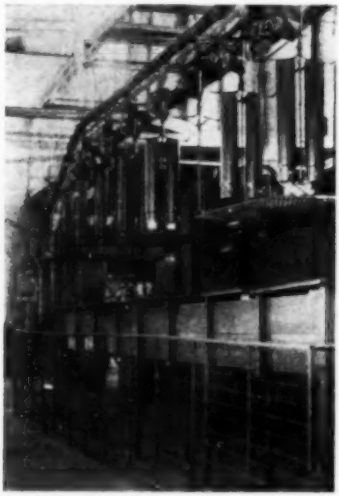
strongly attracted electrical field is established between all parts of the item and the grids. The additional force resulting from this field causes the excess paint which forms "tears" and "fatty" edges to leave the part, with the result that the item can be baked to a smooth uniform finish.

A specially designed voltage supply, producing high-voltage electricity at very low amperage, energizes the detearing grids. Since there is no occasion for plant personnel to be in the vicinity of the grids while they are working, the entire unit may be guarded in such a way that it is perfectly safe. In the event that the grids are accidentally contacted by an individual, the resultant shock, although annoying, is in no sense fatal or dangerous.



Dip-coated shell cases moving away from dipping tank and drain board, and passing over detearing grids where the clinging tear drops of paint are removed electrically.

The flowing characteristics of the paint, the evaporation of the solvent and the size and shape of the coated article strongly affect the efficiency of this equipment. These factors must be correlated with the detearing time and the drain time in order that a satisfactory job will result. The time required for detearing in our setup is approximately two minutes.

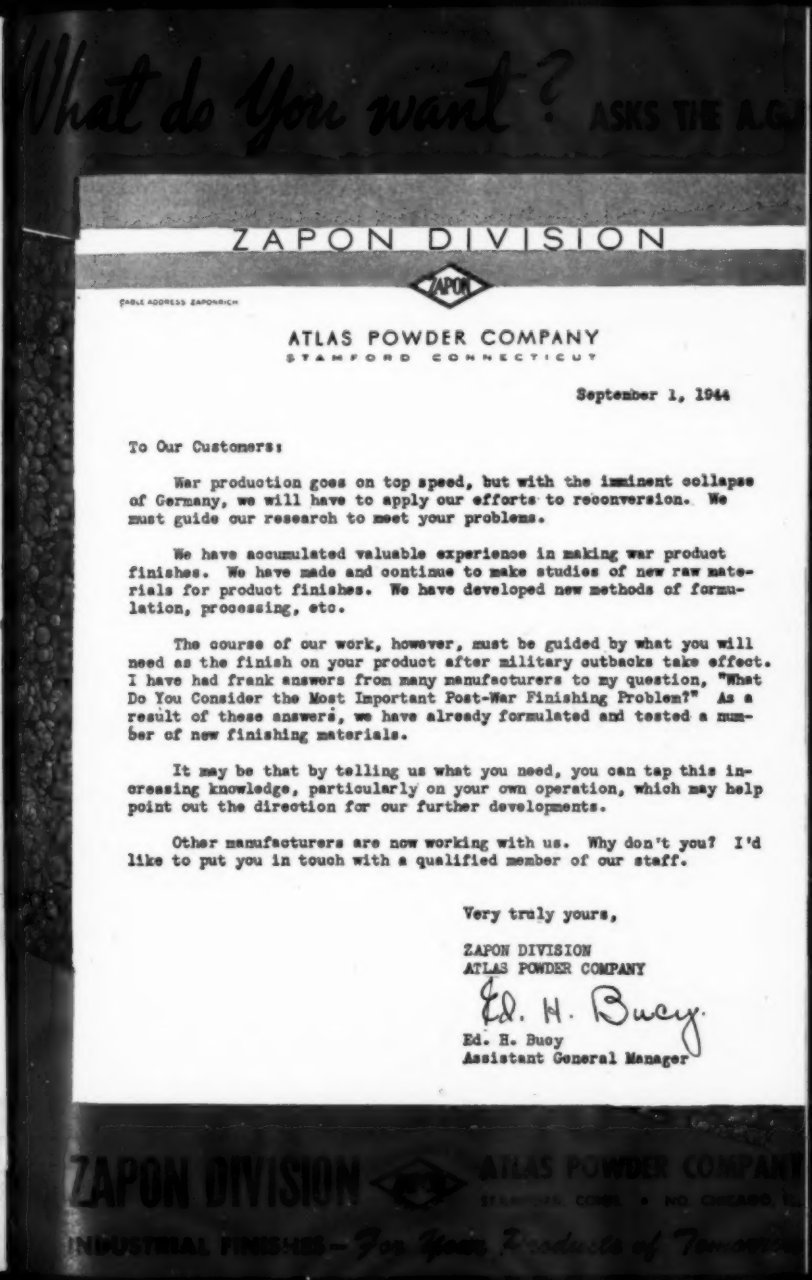
Beneath the grids we have an air tunnel with outlets at the top in order to create a continuous current of air flowing upward past the traveling shell cases to carry away any solvent fumes which remain in the cases and which might hinder the proper drying of the paint on the inside.

From the detearing field, the units enter a gas-fired baking oven, where they receive a 25-minute bake at 325°F.

**Oven Baking; Cool Off; Inspection; Touch-up; Stamping Identification**

After leaving the oven, the units pass through a 10-minute cooling space. Then they are inspected and given any necessary touching up. Identification and lot numbers are applied to the cases before their removal from the conveyor line. For this operation, we use a specially made rubber stamp, and special fast-drying waterproof marking ink. The units are then removed from the line for packing and shipment.

The handle bolt, which is a part of the outer cap, and which is used to force the pressure plate tightly onto the case, receives a special treatment. The bolts are precleaned and the threads are covered with small rubber masks to protect them from the cleaning solutions and the paint. At the end of the line these masks are removed, and a small quantity of AXS 673


What do You want? ASKS THE A.G.
ZAPON DIVISION
ZAPON
CABLE ADDRESS ZAPONRICH
ATLAS POWDER COMPANY
STAMFORD CONNECTICUT
September 1, 1944
To Our Customers:
War production goes on top speed, but with the imminent collapse of Germany, we will have to apply our efforts to reconversion. We must guide our research to meet your problems.
We have accumulated valuable experience in making war product finishes. We have made and continue to make studies of new raw materials for product finishes. We have developed new methods of formulation, processing, etc.
The course of our work, however, must be guided by what you will need as the finish on your product after military outbacks take effect. I have had frank answers from many manufacturers to my question, "What Do You Consider the Most Important Post-War Finishing Problem?" As a result of these answers, we have already formulated and tested a number of new finishing materials.
It may be that by telling us what you need, you can tap this increasing knowledge, particularly on your own operation, which may help point out the direction for our further developments.
Other manufacturers are now working with us. Why don't you? I'd like to put you in touch with a qualified member of our staff.
Very truly yours,
ZAPON DIVISION
ATLAS POWDER COMPANY
Ed. H. Bucy.
Ed. H. Bucy
Assistant General Manager
ZAPON DIVISION
ATLAS POWDER COMPANY
INDUSTRIAL FINISHES — For Your Products of Tomorrow

is placed on the threads protruding into the cap. When the handle bolt is screwed back out, preparatory to placing the cap on the case, the threads of the locking nut in the cap also receive a coat of the preparation.

### Salt Spray Test

To come up to specifications, the paint on shell cases must stand a 250-hour salt spray test. We have built our own salt spray machine, and can tell at any time how the finish is standing the test. The salt-spray machine consists of a small steel cabinet in which test panels or various parts of the unit can be suspended. A small compartment in the cabinet holds the specified salt solution, which is atomized into a continual mist, by a small air unit. Charts for each part tested are carefully kept, as to the time in the spray and the condition of the panel at various stages of the test. The temperature in the room is kept at 90°F.

Our paint supplier and the manufacturer of the detearing equipment have worked in close cooperation with us on our finishing problems, and although we still have problems to solve and wrinkles to iron out, the most important thing is that we are turning out shell cases, which, we know, will help to bring closer the defeat of the Nazis and the Japs.

---

## *Interchemical Takes Over Two Finish Concerns*

Interchemical Corp., 350 Fifth Ave., New York 1, N.Y., is broadening its position in the specialized finishing field, both geographically and in range of products.

A subsidiary of Interchemical Corp. has contracted to acquire the assets and business of Murphy Varnish Co., which has long enjoyed a national reputation for high grade industrial finishes. Its main plant in Newark, N.J., has been an institution there for more than three quarters of a century; it also has a plant in Chicago and a branch in San Francisco.

The present management and personnel, headed by Charles J. Roh, as President ,and Paul S. Kennedy as Vice-President, will continue intact; but the name will be changed to the more broadly descriptive one of Murphy Finishes Corp.

Scriver and Quinn, Inc., of Los Angeles, will also become a subsidiary of Interchemical Corp. C. E. Burge will continue as President, and W. H. Dernell, manager of the Southern California branch of Ault & Wiborg, will become Vice-President. Scriver and Quinn, Inc. has been in business in Los Angeles for 55 years and is a manufacturer of industrial finishes and household paints and varnishes.

Heretofore, Interchemical Corp.'s activities in the industrial finishes field have been carried on by its Ault & Wiborg Division at Cincinnati, O. Ault & Wiborg has been recognized as a leader in fine industrial finishes since 1878. Joseph R. Esposito is President and Joseph G. Morris is Vice-President of this division.

The three units will continue to operate independently. The addition, however, of the personnel, plant facilities and laboratories of the two new companies to the already large facilities of Ault & Wiborg, and the fundamental research laboratories of Interchemical Corp. will help Interchemical, as a whole, to render excellent technical and manufacturing service to users of industrial finishes throughout the country and will impart results of war time research to specialty paints and clear coatings for use on civilian products.

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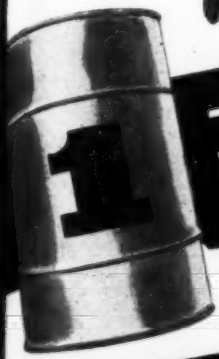
## *Ferro Enamel to Build New West Coast Plant*

Plans for a new manufacturing plant, to be located in the Los Angeles area, are announced by Mr. Robert A. Weaver, President of Ferro Enamel Corp. The new plant, according to Mr. Weaver, will produce porcelain enamel frit and synthetic-enamel industrial paints.

Ferro's Engineering Service, in the porcelain enameling and other ceramic fields, will also be available through this new organization.

Mr. John A. ("Jack") Rumer, long identified with Ferro and for the past ten years the West Coast Representative, has been appointed manger of the new operation. His long experience with the company and intimate knowledge of far western customers' needs should prove very valuable in his new position.

# A drum from Reliance is *Twice* filled!




**—with the finishing material You Know is right for the job**

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***You are invited NOW to submit to us your post-war finishing problems. Our research and engineering departments are at your command without obligation. Write us.***

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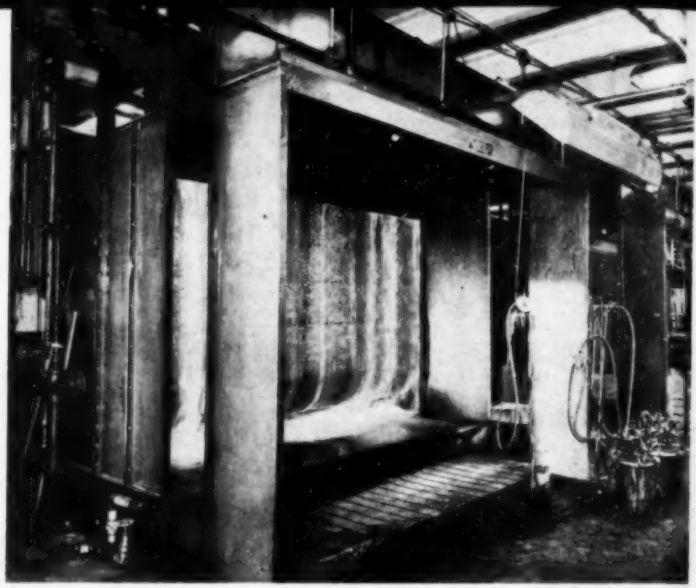

A wall of falling water forms back of water-wash spray booth. Overspray is collected and paint residue is deposited in tank. Photo, Binks Mfg. Co.

# WATER-WASH *Spray Booths*

**BY PETER P. WOOD**

THE EQUIPMENT we now refer to as a "water-wash" or "waterfall" spray booth provides a practical method of washing out and recovering paint overspray from the paint-laden exhaust air. Water-wash spray booths have become a desirable and profitable investment for several reasons. Among other things, they are the means of effecting a substantial reduction in the fire hazard which is generally associated with dry spray booths, particularly where lacquer is sprayed. The use of synthetic enamels also presents fire hazards in and around dry spray booths.

What contributes chiefly to the reduction—in fact, almost the elimination—of fire hazard at water-wash spray booths, is the cleanliness and continuous wet washing of all areas that otherwise would soon become heavily covered with overspray exhaust. When a water-wash booth is operating properly, no paint-laden air escapes from the exhaust stacks to be deposited over roofs or walls of plant buildings and perhaps over neighboring property. No waste paint accumulates inside exhaust stacks (some of which are not easily accessible)

here it is!

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# AIDANAMEL

***A new, extremely fast-drying, one-coat baking enamel . . . developed after several years of patient laboratory research***

- Made of non-critical materials.
- 10-minute baking period . . . dries with a glossy, glass-like finish.
- Durable and elastic . . . ideal for all metal surfaces.
- Colors . . . white and a wide variety of tints.

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*With strict adherence to United States Army and Navy specifications, we produce a full line of protective coatings for all wartime applications. Your inquiries will receive immediate attention.*

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**The Monroe Sander Corporation**

10-18 46th Avenue Long Island City 1, N. Y.

or on exhaust fan blades and elsewhere in the vicinity of the spray booth exhaust.

Where does the overspray go? It is immediately washed out of the exhaust air and deposited into a tank of water from which the solids can be skimmed off and saved if this is desirable. Otherwise the waste material is removed at intervals and disposed of in some safe way.

### Adding Compound to Water To Condition it for Service

After a water-wash spray booth is installed, its operation and maintenance should be entrusted to an intelligent and dependable individual who can read instructions and who will follow them faithfully. In most installations the water used in connection with the water-wash exhaust system must be treated with a chemical compound to properly condition it for performing its work satisfactorily. The manufacturer of the equipment furnishes instructions for this water conditioning (usually called compounding) and either supplies the chemical compound that must be added to the water, or directs where it can be obtained.

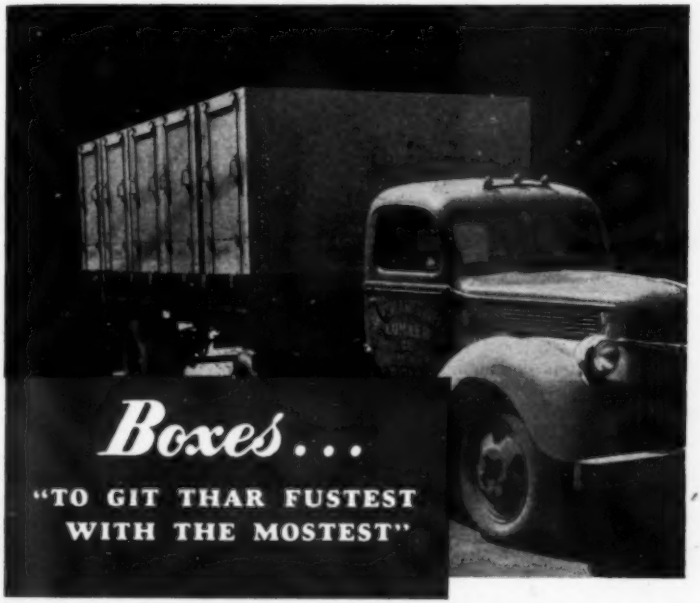
Naturally, after the water-wash equipment is installed and in service, it is up to the attendant to keep it in proper condition. One of his important responsibilities is to alter the formula of the compounding to meet the requirements and conditions that prevail at any given time in the plant where he works. He must consider several factors, any one of which may require that he use more or less compound to properly condition the water; for example, the "hardness" of the water, type of paint or combination of paints being sprayed in the booth, quantity of paint being sprayed each day, and how much paint solids and solvent are entering the water chamber as overspray, etc. All of these conditions have varying effects on the performance of the system.

During the first two to four weeks after the installation of a new water-wash booth — or after any change of paint products, methods, colors, thinners, production increases or decreases — a close watch should be maintained and a tabulated record should be made of all compounding and titrating (testing the condition of compounded water) to establish what it really is instead of depending on what one thinks it should be.

### What Harm Too Much or Too Little Compounding Does

A water-wash spray booth will not give proper results if its water is over-compounded or under-compounded. If the water is over-compounded, the paint vehicle surrounding the pigment particles becomes "burned" and the particles settle to the bottom of the water tank. The paint vehicle becomes broken up into many small droplets and emulsifies in the water. These emulsified droplets, if broken while passing through the pump, piping, header, nozzle, orifice, or when they hit against wells or baffles inside the water chamber, will stick to the surface. This apparently minute trace of paint vehicle accumulates over a period of time and eventually it affects the operation of the system. This accumulation must be cleaned off to restore satisfactory performance of any water-wash booth.

Under-compounding of the water used in a water-wash system




Speedy production painting of overseas shipping boxes is a vitally important wartime need . . . especially when the product to be shipped is aircraft engines. ¶ In this particular case, the paint previously used was much too slow for conveyor line painting and assembly, so the customer called in a Berry Brothers' man. ¶ Berry Brothers' laboratories developed a new and faster-drying, self-priming paint (No. 110 Rolls-Royce Gray) and now 30 minutes sees each box completely painted inside and out, ready for shipment. ¶ Inside surfaces get one coat. Outside surfaces get two. The first coat is applied to the unassembled parts and the second coat is applied to the assembled box as it nears the end of the assembly line. ¶ What is your wartime painting problem? A Berry Brothers' man will be glad to help you with it. Write or telephone.

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creates trouble by allowing the overspray (solids and vehicle) to settle to the bottom of the water tank in a gooey mess. As the live paint-drops settle to the bottom of the tank some of them are drawn into the pump intake. These drops of paint, when they make contact with metal surfaces, stick and eventually must be cleaned off, which generally involves the employment of costly maintenance labor.

### How to Know When You Have Water Compounded Correctly

When the water for a water-wash system is compounded properly, the paint particles will first settle a few inches in the tank of water and then return to the surface where they form into a floating mat of waste paint. The action should be fast enough so that no paint particles will go deeply enough in the tank of water to get into the pump suction line. Of course a few may do this regardless of all precautions.

A simple rule of thumb method for determining the approximate effectiveness of compounded water in a water-wash system is as follows:

1) Wet one of your hands with compounded water.

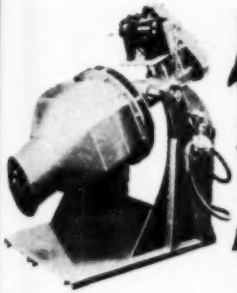
2) With your wet hand, skim off a sample of the waste paint material floating on the surface of water in the tank.

3) Compress it in your hand to squeeze out as much water as possible.

4) Continue this compressing until the paint material in your hand is putty-like or dry.

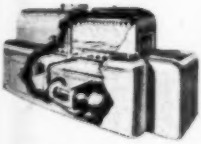
If the material compressed in your hand, as directed by Rule 3, sticks to your hand, you need a "stronger" solution. In other

Skimming off floating paint residue which has accumulated in the settling tank of a water-wash spray booth. Photo, courtesy of The DeVilbiss Co.



ROTO JUNIOR for deburring honing or polishing.

HANDIPLATER for production plating small parts.



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Don't wait until the war is won to prepare for your post-war conversion problems. Now is the time to decide upon the necessary new equipment for your future products—one of our service engineers will be pleased to be of help. Ask him to assist you with your every metal cleaning or finishing need, help you determine the fastest, most effective compounds and equipment.

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words, more compound must be added to the water to correct it.

If the material collected appears like dry pigment, with no adhesive qualities, your compound water is "too strong." You will need to "weaken it by adding untreated water — or add less compound at the regular intervals.

When you compress the material and continue as directed by Rule 4, if the paint residue does not stick to your wet hand, and if it works into a mass of about the same consistency as glazing putty, then your compounding is about correct.

### Why More Compound Must Be Added at Intervals

The waste paint, in the form of overspray, that enters a water-wash system has a deadening effect on compounded water. Therefore, in order to keep the system operating efficiently, more compound must be added from time to time. How often to add more compound to the water, and how much to add each time—these bits of information must be determined by making your own calculations, based on conditions that prevail in your plant.

When only small quantities of paint mist are entering the washing section, the interval between times of compounding may be as long as ten hours. However, when large quantities of paint mist are entering the water section, additional compound may need to be put in as often as every three hours or every two hours.

The type of solvent or thinner used in the paint has much to do with the frequency of compounding. For example, alcohol has little effect as a deadener to the water-wash compound; but if kerosene or some heavy petroleum

Man using a titrating set to check condition of compound (chemically treated) water in water-wash spray booth. Photograph, The DeVilbiss Co.

product happens to be the paint solvent, the deadening action will be quite pronounced, necessitating frequent compounding.

### A Titrating Set Is Needed To Measure Water's Condition

To accurately measure the "strength" of the compounded water in a water-wash system, and to determine how often to add compound, the operator needs a titrating set. Tests should be made with the titrating set at regular intervals, to determine whether or not the treated water is in proper condition for maximum performance.

Everyone in industry realizes that an alkaline washer for cleaning metal parts will not function properly unless care is taken in maintaining the proper strength

*(Continued on page 63)*

## TO MAINTAIN SMALL PARTS PRODUCTION AT HIGH LEVEL

### DIAMOND T *installed this Time-Saving, Cost-Saving Mahon Washing, Drying and Nox-Rust Dipping System*

The Diamond T Motor Car Company, Chicago, Ill. has done a spectacular job of production boosting the past four years—attaining many times pre-war capacity. Modernization and mechanization has made it possible.

Contributing to this speed-up plan is the Mahon automatic Washing and Coating System, pictured above, for the processing and finishing of gears, rings, valves, bearings, etc.

Parts are loaded, individually or in baskets, on a continuous overhead conveyor that carries them through a specially-developed, steam-heated, 3-stage Washing Machine for removal of oil, grease and other foreign matter. Emerging from the washer, they next pass through a double rinse and then past an air hose station to clear the moisture out of cavities. From this point they continue into the oven unit of the system, where they are thoroughly dried before entering the dip tank to be coated with a rust-inhibiting oil solution that air-dries to a tough, protective film.

*This is but ONE example of Mahon cooperation—for ONE specific purpose. The assistance of Mahon engineers is completely available to you on any processing or finishing problem you may encounter*

THE R. C. MAHON COMPANY
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Designers and Manufacturers of Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Chemicals, All Types, Filtered Air Supply Systems, Hydro-Foam Dust Collectors and Many Other Units of Special Production Equipment—Including Complete Finishing Systems

# *The Mystry*

## Or how a Du Pont ar Se
## stopped a creepin finish

**PROBLEM**—An Eastern manufacturer faced this perplexing problem: Flat sheets of metal which he was finishing and fabricating were coming out of the baking oven with an uneven coating . . . bare spots were showing in places. The finish was creeping and crawling—but why?

**CAUSE**—The manufacturer suspected a number of causes, but a careful check showed everything apparently in order. He shut down the entire baking system and thoroughly cleaned it—but the trouble persisted. Completely stumped, he and pro called on Du Pont for help. further

**SOLUTION**—The Du Pont Service If you Man was satisfied that the fault was call on due to the presence of oil. Upon in- help. H vestigation he discovered traces of ground oil oozing from the fan shafts in the with the oven. It soon became obvious that the "m this excess oil was being picked up often. by the motion of the fan—atomized your pro and dispersed throughout the oven dations. By adjusting the automatic oil cups E. I. du so as to feed less oil to the fan shafts (In the finishing problem was overcome Wil

## WRITE OR WIRE THE DU PONT WAR SERVICE MEN MAI

☐ *How to speed output and save materials*

Handy pocket-size, fully illustrated booklet, *"Hints on Wartime Finishing Economies."* Shows you 11 points to check for greater efficiency and speed on your war contract finishing schedules.

☐ *How to meet emerge and solve problems*

Check here for the help of Du War Service Men—skilled "tr shooters" to straighten out "k in your finishing system *bef after* the trouble occurs. "know how" is at your dispo any war contract finishing. about your trouble. Or wi case of emergency.

# ystry of the OOZING OIL

## Pont ar Service Man eepin Finish

ped, h and production continued without further trouble.

Servic If you have a finishing problem, ult wa call on a Du Pont Service Man for pon in help. His wide experience and back- races o ground enables him to help you ts in th with the really tough problems . . . ous th he "mysteries" that crop up so cked up often. He will be glad to discuss comize your problem and make recommen- e over dations. For his help, write: oil cup E. I. du Pont de Nemours & Co. n shaf (Inc.), Finishes Division, ercom Wilmington 98, Delaware.

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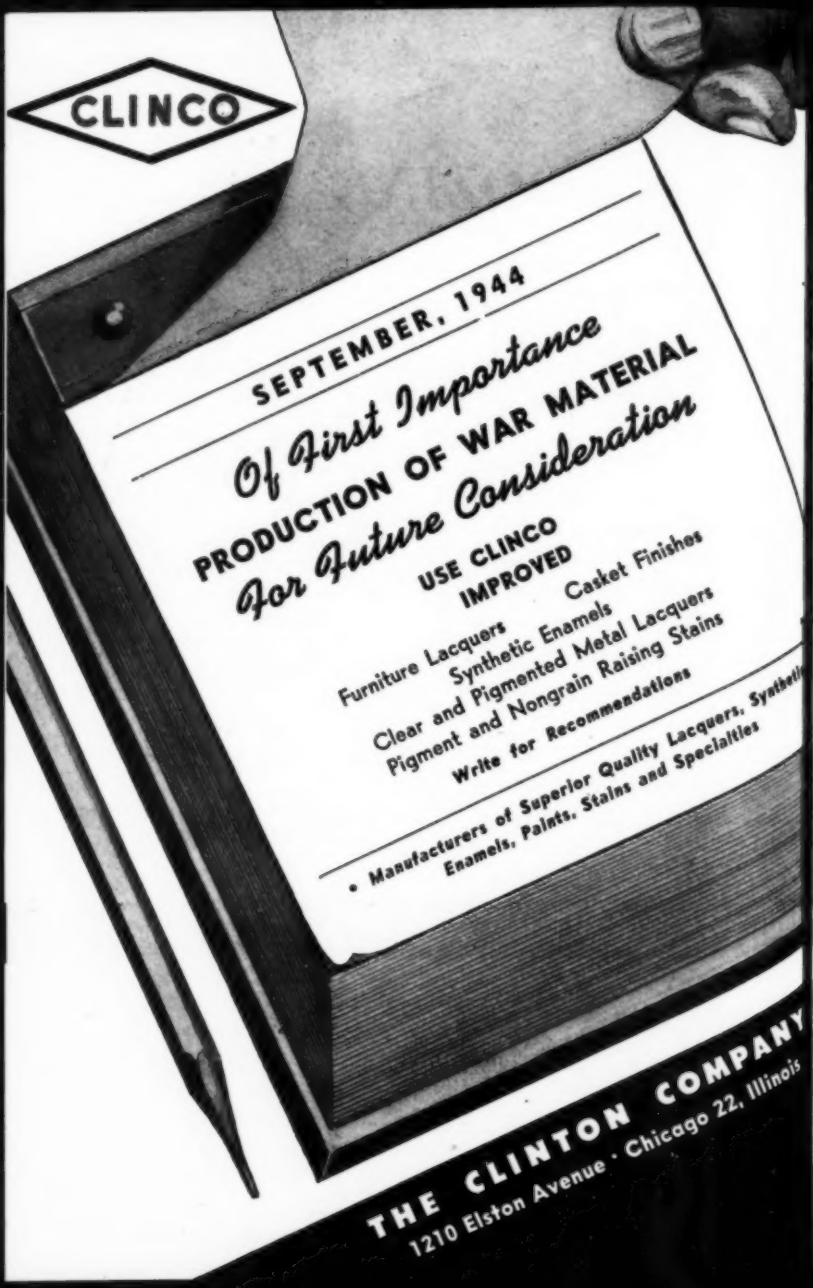
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**If industrial users of paints and other finish materials will follow the simple procedures revealed in this article, I am sure they can save tremendous quantities of paint otherwise wasted; also they can make substantial savings in the cost of spray system maintenance.**

of the cleaning solution. A water-wash spray booth is also a washing machine—arranged differently but with essentially the same function. Both have a water tank, a header and a pump. In each case the relation between the number of gallons of water pumped, and the number of gallons of water in the storage tank, is directly responsible for the results obtained.

To explain this further, if you attached a 100-g. p. m. (gallons per minute) pump to a tank holding 100 gallons of water, and if you operated the pump at near capacity, the water turbulence would be so great that it would be almost impossible for waste paint to rise to the water's surface and collect in a mat that could be skimmed off. If the pump were of 100-gallon capacity and if you had 1000 gallons of water in the tank (which is not the ratio required, but it illustrates my point better) you can see that the water would have little or no turbulence. With this condition prevailing, the compound in the water acts on the paint particles, allows them to return to the surface and form into a mat on almost still water. The ratio of volume of water in tank, to volume of pump capacity, should not be less than 3 to 1. Anything over this ratio has merit but it takes up added floor space.

**Performance of Water-Wash System Depends Upon . . .**

In the header, where the water does its work, some manufacturers use special nozzles; some prefer open nipples, while others get along with nothing more than open holes. Each type of outlet has its own particular merits—and each one can give trouble in its own way. For easy explanation in this article I will refer to all types as a "nozzle."

Nozzles in the header are designed and positioned to give the desired direction and atomization to the treated water in the water-wash chamber. Some engineers believe that finely atomized water is better, while others insist that large, heavy drops accomplish more. Whatever method is employed, you can be sure of one thing: The air passing through the waterfall becomes 100% saturated. With the air saturated and moving at several hundred feet per minute through the chamber, it must pass through or around various baffle plates or obstacles to reduce this moisture before it reaches the exhaust fan. The baffle plates or obstacles are of various designs. Some are removable; others are stationary. Each type of design has its own special merits.

When a water-wash system is operating properly it collects paint particles during saturation, returns them to the tank, does not allow them to get to or beyond the exhaust fan, and it exhausts a minimum of moisture up the stack. *(To page 64)*

**Waste Paint Doesn't Stick To Water-Wash Chamber, if . . .**

The question might arise, "Why do paint particles stick—or why do they not stick—to surfaces inside the water-wash chamber?" The answer to this is the compounding of the water. If the water is properly compounded, the water-wash chamber will remain fairly clean. If the water is improperly compounded, paint overspray will collect rapidly on certain inside surfaces of the water-wash chamber.

In the foregoing explanation I have tried to emphasize the fact that proper compounding of the water is a highly important factor in the correct operation and maintenance of a water-wash spray booth. In fact one manufacturer declares that he "can correct any spray chamber trouble with compound."

**Procedure Suggested to Make System Work 100%**

For those who desire to follow these suggestions in an effort to cut their maintenance costs, I suggest the following procedure: Begin at the source, which is the spray gun. A water-wash system is designed to collect paint particles which are released by the spray gun and caught in the exhaust stream.

First, establish proper air and fluid pressures at your spray gun, as explained so clearly and completely in the article, "Avoid Wasting Material by using Correct Spray Set-up," published in April, 1942 issue of this magazine. This makes for economy as well as for production efficiency.

Second, establish a method of handling the spray gun, so the spray operator will "stroke the parts" being sprayed in such a way as to get the paint on the work instead of in the booth. This is a motion-study problem.

Third, establish the proper compounding and titrating procedure according to the "hardness" of the water, quantity of paint being sprayed, type of solvent being used, etc., as explained elsewhere in this article.

---

## Rockloid Baking Enamels

A Technical Bulletin from Standard Varnish Works, 2600 Richmond Terrace, Staten Island, N.Y., gives interesting data about the company's new Rockloid Baking Enamels and some of the severe tests they will withstand in service.

---

## L. F. Weyand Promoted by Minnesota Mining & Mfg. Co.

L. F. Weyand, general sales manager of the Minnesota Mining & Mfg. Co.'s Adhesive and Coatings Division since 1936, has been promoted to general manager, a new post entailing

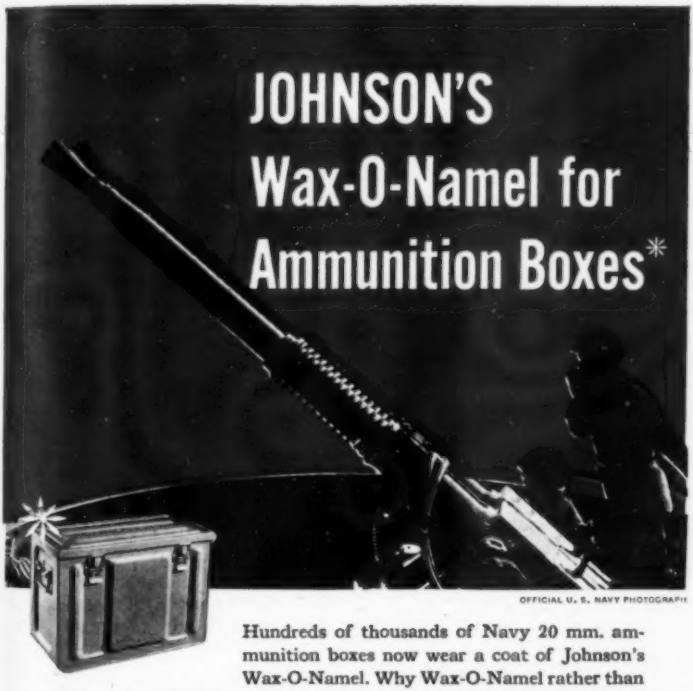
L. F. Weyand, now General Manager of Minnesota Mining & Mfg. Company's Adhesive-Coatings Division in Detroit.

responsibility for all production, sales, research and laboratory activities of that division.

Mr. Weyand has been associated with the company for 28 years. Under his leadership, the Adhesive and Coatings Division has become widely diversified, both as to the kinds of adhesives produced and the classes of trade served, and has grown into one of the important divisions of the 3-M organization.

Mr. Weyand will continue to maintain headquarters at the 3-M factory in Detroit, where all adhesive and coating activities of the company have been centered for eight years.

# JOHNSON'S Wax-O-Namel for Ammunition Boxes*



OFFICIAL U. S. NAVY PHOTOGRAPH

Hundreds of thousands of Navy 20 mm. ammunition boxes now wear a coat of Johnson's Wax-O-Namel. Why Wax-O-Namel rather than ordinary paints? Because makers of Navy ammunition boxes know that tough, hard-drying Wax-O-Namel more than meets Navy requirements *without* cost penalty. And in production, Wax-O-Namel assures trouble-free performance. It is easily and economically applied either by spraying or dipping. Cured either in conventional ovens or in infra-red drying banks.

The finish is uniform, hard, scratch-resistant, durable and rejects are practically unknown.

Johnson's Wax-O-Namel may be able to contribute substantially to solving your immediate war production or peacetime finishing problems.

TODAY Wax-O-Namel provides extra protection for implements of war.

TOMORROW Wax-O-Namel will provide extra protection and new beauty for postwar home equipment.

*Finish the war faster—*
*buy more War Bonds!*

S. C. JOHNSON & SON, INC.
PRODUCT FINISHES DIVISION
Department IF-94
Racine, Wis.

# Our Reconversion Plans

**The 5-point postwar program of a manufacturer of novelty wood furniture is presented.**

*BY JOSEPH HALPERIN*

AS A FAIRLY large woodworking plant, producing novelty furniture, we are planning a 5-point program for postwar. Briefly, here it is:

**1. New Equipment:** During war time, the big emphasis was on faster production. As a result, people became conveyor and automatic equipment minded. Our plans include a platform-and-chain conveyor from assembly department to finishing room. This conveyor will travel through the dip, sealer and varnish treatments and then through the varnish kiln for drying. We will also use platform conveyors for moving materials from first to third floor in a multiple-story plant.

Further, in new equipment, we are going to install storage tanks for inflammable materials. An experiment in new equipment will be large spray booths where four sprayers can spray at one time, with no wall in between, instead of the individual spray booths we now have.

**2. New Products:** Far from being a radical firm, we have decided to use practically the same standard styles we have been using during the past several years. Furniture is not like radios, refrigerators, automobiles and airplanes. People may choose modernity on these latter items, but when it comes to furniture in the comforts of home, the standard period furniture seems to fit the average pocketbook. Making moderately priced merchandise, we will stay in the conventional lines, with perhaps a bleached finish in walnut and mahogany.

**3. New Raw Materials:** The war has spurred up the development of a number of raw materials. Plastics to be used in woodworking are coming into their own. The new duPont methods for drying wood have proved to be a success. Molded wood products will be a thing of the future. Our plans include combinations of wood and plastics for our merchandise, and waterproof glues in construction.

Backs and drawer bottoms are to be made of Masonite or some fiberboard instead of plywood. True plastics and decals are to be used in decorative effects. Glass is to be used in a greater variety of detail.

We do not intend using anything radical in finishing materials. We plan to use the same sealer, varnish, naphtha, stains and lacquer. There has been a great deal of talk about fast-drying stain, non-sanding sealers, non-wiping stains, but as far as we have been able to figure out at the present time, the old reliables can still be used for quite some time to come. If and when these new things do

## Let Despatch give you production figures on these new systems

*Is your equipment adequate* for finish-baking new products released by civilian "go ahead" orders? Can you meet production demands? Can you bake out new-formula synthetics to meet specifications?

Can you keep up with competition, meet changed labor conditions, and make a *profit* with your present finish-baking equipment and methods?

Despatch has the answer to many of tomorrow's finish-baking problems—in 4 new baking systems:

Despatch **CONVECT-O-RAY** • Despatch **SURG-BAKE**

Despatch **CONVECT-O-BAKE** • Despatch **INFRA-RED**

**WRITE TODAY! A Despatch Resident Engineer in your vicinity will explain these new systems, their application, and assist you in planning your new finish-baking oven layout. No cost or obligation.**

**DESPATCH**
OVEN COMPANY MINNEAPOLIS

come through, the finishing industry can rest assured that the woodworking plants will be in line.

**4. New Labor Ideas:** The war has taught all manufacturers to appreciate and respect the working man. As a result of this, incentives, bonus plans and labor-management have sprung into being. It is safe to say that only with high wages can the working man, in turn, as a consumer, buy the manufactured products that he needs. We intend to keep on fostering the idea of satisfied personnel. It has been demonstrated to us that this has paid dividends.

**5. New Building Program:** It is our belief that the country will enjoy prosperity for several years to come and, due to the fact that retailers' stocks have been greatly depleted, we intend to start on a plan which will enable us to produce merchandise that our customers and their customers want.

All in all, it looks like we intend to be in the thick of things and be humming along for many years to come with new ideas and new equipment on an old job.

---

**A corrosion-proofing liquid** for temporarily coating parts not otherwise coated, to make certain that their surfaces will not corrode during shipment or temporary storage, has been found to be especially good on materials for export, including aircraft, ordnance, machinery, tanks and tools. It is good also for use on products to be marketed in our own country. It may be applied by dipping, spraying or brushing; forms a thin brown coating that is self-healing in case it is scratched or broken, is resistant to the action of water, vapors and actinic rays; can be removed by the use of a hydrocarbon solvent, when you are ready to finish the materials.

---

In addition to paints, varnishes, enamels and similar protective and decorative finishes, many other materials which are not strictly coatings, are used in the finishing industry. Some of these are putty, paint removers, driers, fillers, polishes, etc.

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Tung oil, a most important drying oil used in finishing materials, is obtained from the nuts of the trees *Aleurites fordii and Aleurites montana*, both of which are native to our ally China. [These trees are also grown in the southern part of our United States now.]

---

## *Burke to Handle Western Sales for Zapon*

Casper Apeland, General Manager of the Zapon Division of Atlas Powder Co., announces that Gordon D. Burke has been appointed sales manager for the Western Sales Division.

In 1929 Mr. Burke became associated with Brevolite Lacquer Co., later acquired by Atlas Powder Co. From 1932 to 1938 he was a salesman in the North Chicago area, and from 1938 to 1941 he acted as technical advisor to the sales department in connection with industrial finishes. In October, 1941 he was transferred to Wilmington as manager of priorities for the purchasing department, where he remained until his present appointment.

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## *Harry Scott Wherrett of P.P.G. Co. Dies*

Harry Scott Wherrett, 68, chairman of the board of directors of the Pittsburgh Plate Glass Co., associated with the organization for more than 53 years, the longest service record of any employe, died on August 13 after a brief illness. He had long been active in business, civic, and philanthropic affairs of the city of Pittsburgh.

**METL-PRIME is a new product now offered by Egyptian after exhaustive prove-up tests. As its name indicates it is a primer for metal.**

**Sprays on or Dips.**

**Air-dries dust free in 5 minutes; to handle, 10 minutes; to practical hardness, 20 to 30 minutes.**

**Gives hard adhesive satin finish — no sanding needed before lacquer or other top coating.**

**METL-PRIME won't lift. It won't bleed through even a white lacquer enamel top coat.**

**This new Egyptian product possesses all the inherent quality of the Egyptian line. Meets today's need; fits admirably into post-war tomorrow.**

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EGYPTIAN FINISHES
EGYPTIAN
SPECIALIZED PRODUCTION FINISHES

*Recently I made a trip to a customer's plant to straighten out the rubbing procedure. Methods they were then using produced a dull, muddy dingy film. By means of the methods described in this article I was able to set up a procedure that produced a clean rubbing job which did not develop a haze afterward. Results were striking, and the customer was pleased.—*

Rollin H. Wampler

# Rubbing Finishes on Wood Furniture

ON ALL except the very lowest-price grade, the finish on wood furniture is rubbed, or rubbed and polished before crating or boxing for shipment. This final step in furniture finishing frequently does not receive the thought and attention it deserves.

The purpose of rubbing is to supplant the raw appearance and shine of the finish with a lustrous or velvety appearance or sheen. The rubbing process cuts off particles of lint and dirt imbedded in the final coat, smooths out ridges and "orange-peel," and gives a really professional appearance to the furniture. The finish acquires a beauty and feel that are impossible to achieve in any other way. It is a delight to the eye and to the sense of touch.

Improper or slovenly rubbing procedures may merely produce a dull, muddy appearance and a sticky or rough-feeling surface. In some cases printing troubles may actually be caused by improper rubbing. A favorite and well-justified complaint of furniture dealers is that the merchandise they receive is dirty, rough, and dull or lifeless in appearance. The dealer must actually finish the job (which the manufacturer should have done) before he dares to place the furniture on display before a critical buying public. The dealer fully recognizes the importance of eye- and touch-appeal in selling furniture to the ultimate user. The manufacturer who completes the job obviously has a competitive advantage over the one who does not.

### Three Results You Want; Three Requirements for Job

Rubbing procedures vary greatly according to the finishing materials used and the result desired. In general, the rubbing procedure may aim at three different results. The first is a dull-rubbed finish, which is preferred on most period furniture. The second is a highly polished finish, preferred for modern and so-called "borax" or flashy merchandise. A third result aimed at is a wooled-and-waxed finish, which is not really a rubbing proc-

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**Let's start with the finish; it's what they'll see first!**

STANDARD VARNISH WORKS

*Engineers of Product Finishes*

STATEN ISLAND, N. Y. CHICAGO, ILL.

ess at all. It is an inexpensive way of achieving a finished appearance with a minimum of effort. It produces neither a dull-rubbed or a highly polished finish; but does give an appearance and feel that is better than a raw finish.

There are three important requisites to a good rubbing job. The first is that the finish must be thoroughly dry. A finish that still contains a high proportion of residual solvents, or that is not properly oxidized and polymerized will soften too much, clean up poorly, and tend to lose its luster by becoming hazy, dull, and lifeless within a few days.

The second requisite to a good rubbing job is that the surface must be cut down perfectly smooth before proceeding. If only the high spots are rubbed, leaving glossy spots in the depressions or low places, the finish is not smooth nor uniform in luster. In fact, that is the way to determine whether the finish is rubbed smooth or not. Rubbing should proceed until no glossy spots are left in the film.

The third requisite to a good rubbing job is complete removal of the lubricants required in the rubbing operation. This is the most frequently disregarded precaution, and the source of much grief. A thin, light rubbing oil made from petroleum is practically always used in one form or another. If this oil is not completely removed, excessive softening may occur and the finish may be lifeless and dull. Even if the finish looks good when the operation is completed, it may become hazy and dull in a few days. We shall have more to say about this later.

The theory of rubbing is simplicity itself. First of all, the surface must be cut down to a glass-like smoothness. This requires an abrasive and a lubricant. If the surface is to be left dull, the lubricant is then cleaned off. The scratches made by the abrasive, which should be parallel with the grain, produce the visual sensation of dullness or flatness. The coarser the abrasive, the deeper the scratches and the duller the film.

**Theory of Rubbing; Abrasive and Lubricant**

However, if the finish is to be highly polished, then these rubbing scratches must be removed. This is done by using finer and finer abrasives together with lubricants and sometimes solvents, until the scratches are all removed and a high luster results. A rapidly rotating buffing wheel is sometimes used; this develops enough heat by friction to actually melt the finish sufficiently on the surface to cause scratches to flow out. This effect is of extremely short duration, and if properly done does not damage the finish or induce printing.

If some intermediate sheen is wanted, the process of removing the rubbing scratches is stopped at the proper point.

**Power Driven Equipment; Abrasives Available**

As to actual practice, many materials and techniques are used. A variety of power-driven equipment is available.

The abrasive used for rubbing may be in the form of powder or it may consist of sheets of abrasive paper such as wet-or-dry sandpaper. Pumice, tripoli, and rottenstone are the most commonly used abrasives in powder form. Pumice is used for cutting down the surface rapidly, being a relatively coarse abrasive. Tripoli is somewhat finer and produces a higher

# HORN

*suggests—*

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sheen, but does not cut rapidly. Rottenstone is very soft and fine, and is used mostly for polishing. Many times the actual rubbing is done with a mixture of pumice and rottenstone in order to get a higher sheen on the first rubbing operation, without too much sacrifice of cutting speed.

The wet-or-dry sandpaper comes in various degrees or grades of fineness. The coarser grades are used for fast cutting; the finer grades for removing scratches.

### What Rubbing Oil to Use

A thin petroleum-base oil is generally used as the lubricant for the abrasive. Such a rubbing oil permits rapid cutting, is easy to wipe off, and will not dry white in crevices and intricate carvings when or where the cutting mixture cannot be cleaned out properly. However, such an oil has a tendency to soften the finish, especially if it is not thoroughly dry. Also, when not well removed it will cause the finish to develop a haze a day or so after application. Most "cracker-jack" rubbing jobs, with little effort spent in cleaning up, are nothing more nor less than "grease jobs," leaving a muddy, smeary appearance that offends both the eye and the sense of touch.

An equal volume mixture of kerosene and rubbing oil makes a highly satisfactory oil-type lubricant. It cuts as rapidly as straight rubbing oil, but is easier to clean up and does not have as much tendency to leave a greasy film. It works especially well with wet-or-dry sandpaper.

### Water for Rubbing; Water Emulsion Too

Where the finish is not thoroughly hard, or for some other reason has a tendency to be softened excessively by rubbing oil, water alone may be used as the lubricant. The use of water allows you to cut down the film without making it sticky or tacky. However, water rubbing has some disadvantages. In the first place, it is harder to clean up than oil. Also, the mixture of water and abrasive will dry white in the crevices. Finally, some parts of the article may be sensitive to water. For example, veneer may be loosened if water penetrates the end grain. There is less danger of this, of course, with the newer resin glues.

The reader should not form the opinion that softening during the rubbing process is to be avoided altogether. This is not true, for some softening is necessary for fast rubbing schedules. The point is that when the job is finished the surface should be hard, smooth, and lustrous, with no sign of tackiness. Tackiness is a sure indication of excessive softening.

A desirable compromise between oil and water rubbing is to use an emulsion of oil in water. Several such products are on the market as "soluble rubbing oils." They contain an emulsifying agent, so that one part of soluble oil may be added to from five to ten parts of water. A milky, stable emulsion is formed. This lubricant permits rapid cutting, will not dry white in crevices, will not soften excessively, and is easy to clean up. In addition, the soap-like emulsifying agent has detergent properties, so that it makes an excellent clean-up polish.

When powdered abrasives are used the rubbing pad should be made of felt. The pads on most rubbing machines are made of felt. In hand rubbing a block of felt or burlap is frequently used. Rubbing machines are also fitted with

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attachments for holding wet-or-dry sandpaper. Wet-or-dry sandpaper cuts rapidly and rarely leaves streaks in the surface due to coarse particles of abrasive. Wet-or-dry paper is especially suitable for rubbing down lacquers and the newer heat-curing synthetics, because the older methods are too slow with these hard, tough finishes.

Two types of rubbing machines are in use. The more common one is the portable reciprocating type of machine, powered by electricity or compressed air. This machine makes a stroke of less than an inch long. It is light enough to be moved by an operator over the surface. The other type of rubbing machine is sometimes used for rubbing large table and desk tops. It is stationary and takes very long strokes, the length of stroke and pressure being determined by the operator.

**Finishing the Rubbing; Buffing for Luster**

After the surface is rubbed down smooth it is then simply cleaned up if a dull rubbed finish is desired. However, if a high polish is wanted the job has just begun. Rubbing is continued with a finer abrasive or a fine grade of wet-or-dry sandpaper. After this rubbing the surface is then cleaned up. The final polish may be obtained by hand or with a rotary buffing machine. Special emulsion polishes containing very fine abrasives are preferred for this work. These polishes may also contain waxes and minute quantities of certain oils that contribute to the high polish.

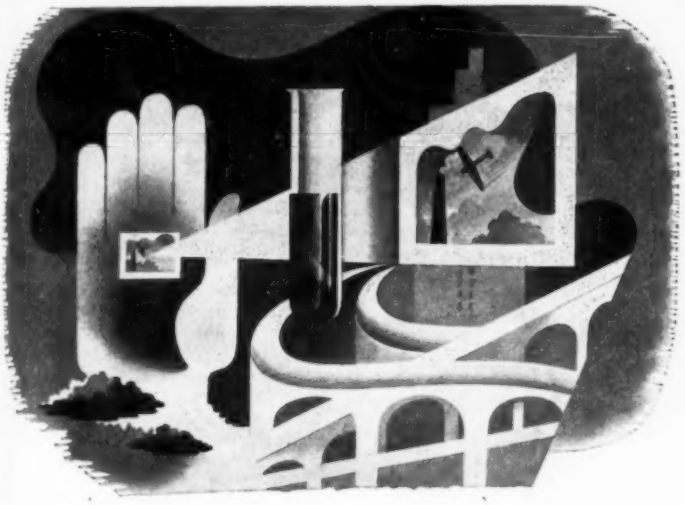
If the work is to be done by hand there just isn't any substitute for "elbow grease." The more effort put into the job, the better the results. However, flexible-shaft, power-driven buffing wheels faced with sheep's wool or felt will make the job easier if they are used correctly. The usual speed is about 3000-r.p.m. Two buffs are usually required. The polish is smeared over the surface and gone over with one. The second buff is used perfectly dry to develop the final high luster. The sheep's-wool bonnets must be replaced daily or oftener. A new one is put on the dry buffer and the one on the dry buffer replaces the one on the first. The bonnet on the first is dry-cleaned.

Buffing wheels may develop considerable heat on the surface by friction, and the operator must be taught to avoid "burning" the surface, especially at the edges.

An important factor, often overlooked in polishing, is the careful removal of all lubricants used in rubbing, before polishing begins. If not removed, they will cause hazing and printing and may prevent development of a high polish.

The wool and wax operation hardly requires description. A fine grade of steel wool, preferably 4/0 is used. The wooling may be done dry, followed by waxing; or the wax may be applied with the wool and then wiped. Frequently, when the expense of dull rubbing a case all over is prohibitive, the top may be rubbed and the front and ends wooled and waxed. However, on high-polished work it is better not to rub the fronts and ends at all unless the job is done well. It is better to do a good job of rubbing and polishing on the top and leave the rest untouched, except for cleanup, than to do a half-way job of rubbing the top and "greasing up" the front and ends. The "grease-job" only makes the finish dull and muddy in a short time.

Here are a few typical rubbing and polishing procedures in indus-



# VISIONARY DREAMS

In test tubes fired by war, chemical research has laid the foundation for far-reaching prosperity. New products have been created, new bases developed, new techniques evolved which stagger the imagination . . . which translates today's dream into tomorrow's demand. How this research will affect your business, what it can do for your product, is obviously impossible to ascertain except by expert examination . . . and such examination should certainly be included in your post-war planning. Our staff of expert finishing engineers will be glad to cooperate with your organization. Your inquiry incurs no obligation. Address The Stanley Chemical Company . . . manufacturers of Stanley Lacquers, Synthetics, Enamels and Japans . . . East Berlin, Connecticut.

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trial use. They produce a maximum of results with least handwork.

**Dull Rub (Lacquers; Synthetics)**

1) Rub entire case with wet-or-dry sandpaper, No. 360 or 400. Use a mixture of equal parts rubbing oil and kerosene for this operation.

2) Wipe off oil.

3) Rub with felt pads. Use tripoli or rottenstone for the abrasive. For the lubricant use a mixture of one part water-soluble (self-emulsifying) rubbing oil and eight or nine parts of water.

4) Go over the entire case with the oil-water emulsion on a piece of waste and clean up with clean waste.

**High Polish (For Lacquers and Synthetics)**

First steps are the same as in previous procedure.

4) Clean up with clean waste.

5) Apply liquid emulsion polish (containing wax and abrasives) or paste abrasive buffing compound.

6) Go over with high-speed flexible shaft buffer with lamb's wool bonnet buff.

7) Go over with a second buff, perfectly clean and dry. This brings up the final luster.

8) Clean up with dry waste.

**Dull Rub (Varnish)**

1) Rub with felt pads. Use 4/F pumice or a mixture of pumice and rottenstone, and rubbing oil.

2) Wipe off.

3) Rub with felt pads. Use tripoli and rottenstone and the oil-water emulsion.

4) Clean up.

5) Apply clean-up polish by hand, using a little rottenstone if there is no abrasive in the polish. Use plenty of "elbow grease."

6) Polish with dry waste.

**Wool-and-Wax Finish (For Lacquers and Synthetics)**

1) Dip 0000 steel wool in liquid or paste wax and rub by hand along the grain.

2) Polish and clean up with dry waste.

Sometimes only the tops of the cases may be rubbed, using one of the procedures just outlined. The remainder of the case is wooled and waxed.

Whenever a high polish is not desired, flat varnishes or flat lacquers or flat synthetics are used. Finished in this manner, only the tops need to be rubbed, provided the remainder of the case is smooth and clean. Low spots and places difficult to rub then do not show up as glossy spots and areas.

The schedules given in this article are susceptible to great variation. But always remember to rub down the surface smooth and clean off all oily lubricating materials.

A final tip is to clean off finger prints and smears after attaching drawer pulls and mirrors, just before putting into cartons or crates. This insures that the customer will receive the merchandise in perfect condition, provided the carton is tight.

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## *Air Scrubber Bulletin*

A new 4-page bulletin describing and illustrating the Ross Air Scrubber has just been published by the J. O. Ross Engineering Corp., 350 Madison Ave., New York 17, N. Y.

Unlike many types of air washers heretofore available, this Ross Scrubber contains no spray nozzles and requires no extensive piping to install, features that eliminate the usual sources of trouble and expense, it is claimed. These Ross Scrubbers not only thoroughly clean air but are designed for use in humidifying, dehumidifying, cooling and fume elimination. The bulletin explains how they can also be utilized to heat white water or fresh water without the need for steam and a schematic layout for such water heating is included.

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**Speedy delivery of specified materials.**

**Service of trained technicians and representatives.**

**Setting up of finishing production schedules.**

**Breaking of bottle necks and consequent delays.**

**Making specification materials work in your plant.**

**Write for our brochure listing some of the Government Agencies purchasing war equipment, and briefly describing some of the more important finishing materials now being used.**

## YARNALL PAINT CO.

*Industrial Division*

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**PLASTIC VENEERS PRODUCE LUSTROUS BASES FOR LAMPS**

*Sans-Marb offers the charm of marble without cumbersome weight. The black and gold marble illustrated is one of many marble reproductions now available in Sans-Marb.*

**SEND FOR FULL COLOR BROCHURE OF WOOD GRAINS AND MARBLE RECREATIONS**

*The Meyercord Co... Chicago 44, Illinois*

## New Ross "Airay" Ovens

The J. O. Ross Engineering Corp. announces new "Airay" ovens which, as the name suggests, are an engineered combination of infra-red radiation and air circulation under proper control. The new "Airay" ovens have been designed not only to take full advantage of the high energy concentration that the infra-red radiation focuses upon the goods, but also to insure uniform heating cycles and proper equalization of ambient temperatures. They are built to remove fumes and vapors through the positive control of air makeup and exhaust volumes.

With respect to the advanced design of these new ovens, it is pointed out that the use of infra-red radiation without proper air distribution must result in excessive waste of heat (and heat that is in the form of electrical energy is generally expensive); lack of uniform heating; difficulties due to gasses and fumes.

In the Ross "Airay" systems, heat losses due to oven radiation and exhaust are reduced to a minimum while maintaining an excellent rate of temperature rise. To be able to confine the heat and regulate the exhaust, infra-red lamps, depending upon the particular requirements, are mounted within either plain or insulated enclosures. These enclosures are made of sheet metal, transite or prefabricated panels of the exclusive Ross tongue-and-groove construction.

The infra-red bulbs, of the medium base, skirted type, are of the newest heat-resisting design and have a non-tarnish sealed-in reflector. They are easy to clean and require little attention. Fans and ducts are all designed for their respective temperatures and conform to the highest engineering standards.

Comparative tests and studies have shown substantially increased efficiency from operation of these new "Airay" ovens, particularly in baking and curing paints, lacquers and other quick-drying and thermo-setting products.

A new bulletin that explains the basic principle of infra-red radiation, its advantages, its limitations and factors to be considered in using it, along with a description of the new "Airay" ovens may be had by writing to the J. O. Ross Engineering Corp., 350 Madison Ave., New York 17, N.Y., or any of its branch offices at 201 N. Wells St., Chicago 6, Ill.; 12953 Greeley Ave., Detroit 3, Mich.; 79 Milk St., Boston 9, Mass.

*Materials Supplies Equipment*

## Enthone Zinc Stripper

The Enthone Co., 441 Elm St., New Haven, Conn., announces the development of an alkaline stripper called "Enthone Zinc Stripper" for the rapid removal of zinc plate. This new product quickly strips zinc plated coatings of all types and thicknesses of the order of 0.001 and will strip in 30 seconds, leaving the metal clean and bright.

Due to the alkaline nature of the solution, the tendency for rusting of the steel after stripping is largely removed, whereas this is a serious problem when acid strips are used. There is absolutely no attack upon the base steel from Enthone Zinc Stripper and the base metal, therefore, is left in its original clean condition after stripping.

The stripper is effective for removing zinc coatings that have been treated with various chromate processes and for all types of bright zinc plates.

The Stripper is supplied as salts

# *Questions* AND *Answers*

**The finishing requirements of all metal products manufacturers in the post-war era pose many questions. The correct answers can be found only by careful investigation and study now.**

**Even if you contemplate no radically new product, your competitive position in post-war markets can be improved by taking advantage of time and cost-saving methods which have been developed during this period of war necessity. If you are planning new products the need for determining the best and most economical finishing methods should be a vital part of your program now.**

**Our Research Division will gladly help you. Just as in the speedy conversion to war production it helped many suppliers of vital war goods get started producing faster and better, it can help you be ready for speedy re-conversion to peace-time production. Your inquiry will be held in confidence and entails no cost or obligation.**

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which are added to water in the concentration range of 2-to-3-lbs., per gallon, and the mixture is heated from 200° to 215° F. Plain steel tanks and heating coils are used. The stripper is ideal for removal of zinc from defective plated work and from plating racks, wires and hooks, and is being used in automatic cycles for cleaning of the plating racks.

## Fungus-Resistant Coating

Insl-x No. 25A Moisture & Fungus Resistant Coating for over-all treatment of assembled ground equipment, such as Walkie-Talkie, Handy-Talkie, Radar, power plants, etc., is announced by Insl-x Co., 857 Meeker Ave., Brooklyn, N.Y. Approved under Signal Corps. Spec. 71-2202 A.

This new material actually exceeds government specifications for fungus resistance and is equally potent in killing higher bacterial forms. It is extra fast drying, becomes "tack-free" in less than 15 minutes; is hard in less than an hour. Most important exclusive quality: It is non-toxic to humans. Official tests show Insl-x No. 25A will not cause dermatitis.

## Metal Protective Coating

Wartime materials shortages and the turning of industry to new metals in the fabrication of their products has brought about many new metal finishing problems.

In the solving of these new problems the Udylite Corp. 1651 E. Grand Blvd., Detroit 11, Mich., has developed and perfected equipment and processing for dichromating of zinc coated steel and die cast parts which shows great promise in the postwar field.

Dichromating is not new but in its original processing it presented so many difficulties and hazards that it was practically useless except as a hand dip coating of unpredictable quality.

The new equipment, plus a new cycle of processing developed by Udylite research engineers, has brought dichromating to the stature of a real possibility in low cost, dependable finishes for everything from die-cast zipper parts to steel shell cases, and a possibility which should not be overlooked in the finishing of peace-time precision parts where eye appeal is not essential.

The construction of the machine is based upon the discovery that absolute control of both time and temperature is vital in producing satisfactory results. This equipment is fully automatic, eliminating all the irregularities of the old hand dip method and carrying bulk parts through a complete processing cycle.

Parts being processed are cleaned, rinsed, dipped, drained and dried continuously with dependable results and no scratching or scarring. Equipment is custom built to meet individual requirements.

## Rust-Preventative Permanent Coat

An amber-colored transparent liquid for coating bright clean metal surfaces to produce a long-lasting tough flexible film that prevents rust and corrosion is called "Lionoil," a product of Berry Bros., Detroit 7, Mich. It can be used as a one-coat finish or as an undercoat for clear or color coats in varnish or lacquer, or it can be used as a mixing oil for oil-base paints.

The "Lionoil" film withstands vibration, expansion and contraction, as well as moisture. It air dries in 8 to 10 hours; bakes in one hour at 250° F., or in 30 minutes at 400° F. It makes an excellent vehicle for zinc chromate or aluminum paints.

## Plast-O-Dip Tank

A new, electrically heated Plast-O-Dip tank has been designed by the Aeroil Burner Co., Inc., of West New York, N.J., for the heating, melting and dipping of ethyl-cellulose compounds. This unit features completely uniform, indirect heating through

## A Lowe Brothers Finish Solves a 155 MM Shell Production Problem

*A manufacturer of 155 mm Shell Casings had a problem on his hands. Poor adhesion of a specification finish was resulting in a high percentage of rejects, slowed-up production, and mounting costs.*

*A switch to a Lowe Brothers finish, made on the same specification, solved the problem.*

*According to the manufacturer, this Lowe Brothers Specification finish is, today, giving perfect adhesion and faster drying without a single change in cleaning or finishing methods.*

*The material supplied by Lowe Brothers "sets up hard, does not mark up or scratch off easily, and speeds up production." Result—fewer rejects, lower cost, and on-schedule production.*

*Whatever your problem —whether it be for War or Peacetime product finishing—remember that Lowe Brothers know-how, and years of experience solving finishing problems of every type are at your disposal. Call upon us—without obligation.*

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the medium of an agitated hot-oil bath that completely surrounds the material, and also places heat in the ethyl-cellulose by a new and novel method.

Both tank and removable cover are completely insulated. Two thermostats automatically hold the oil bath at any desired temperature required by the particular ethyl-cellulose formulation being used.

The Plast-O-Dip tank (dipping space 25-in. long, 13-in. wide, 12-in. deep) can be used for melting, heating and dipping. A heated, removable, adjustable, dividing partition permits the addition of cold compound during the dipping operations without adverse effect on the temperature of the molten plastic.

## Prepare Copper Alloys for Painting

In the preparation of copper alloys such as copper, brass and bronze for painting, lacquering and enameling, it has been difficult to get good adhesion.

The Ebonol "C" process of the Enthone Co., 441 Elm St., New Haven, Conn., will produce a stable, adherent, non-reactive cupric oxide coating on copper alloys that gives high adhesion of lacquers, paints and enamels under severe weathering conditions. The inert nature of Ebonol "C" coating prevents reaction between it and the organic finish. The catalytic nature of copper itself has been one of the causes for breakdown of the bond of organic coatings to copper alloys.

The finish obtained is nap-like in nature, presenting a relatively absorbent base for the paint to be anchored. The process is suitable for treating copper alloys containing from 60% to 100% copper. The lower copper alloys are colored a mahogany brown, and alloys containing more than 65% copper are colored black. The Ebonol "C" finish, therefore, is not suitable as a base for clear lacquers or for one coating of white pigmented lacquer due to its dark color.

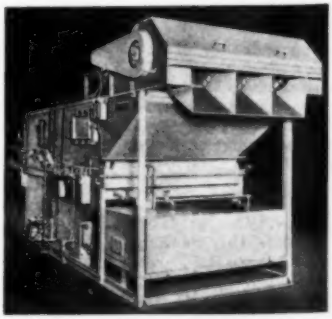
The finish is applied by simple immersion of the work in a dilute solution of the salts operated near 210° F. The treating time is approximately 10 minutes.

## Metal Cleaning Machine for Postwar Use

With the arrival of "V Day," many production lines including such operations as drawing, stamping, heat-treating and cleaning will require revamping before goods for civilian use can be made.

To facilitate the change-over in cleaning set-ups, the engineers of Detrex Corp., Detroit 27, Mich., have in many cases, designed Detrex degreasers and washers to serve both applications with a minimum of rebuilding. Also, their familiarity with the capabilities and limitations, as well as war and postwar uses of present cleaning equipment has enabled Detrex engineers to assist plant committees on their reconversion programs.

The Detrex degreaser shown here has three divisions which permit cleaning of assorted types and sizes of parts. Design of the machine was so coordinated to enable the manufacturer, whose business was in small



War and postwar application of Detrex degreaser for cleaning small parts.

# The Solution to your Wrinkle Finish Problem

## ENTERINKLE

**A SUPER WRINKLE ENAMEL FOR PRODUCT FINISHING**

- **Contains No Alkyd Resins**
- **Available Without Priorities**

**TOUGH - DURABLE - ANY TEXTURE**
***Adaptable to Any Production Schedule***

**NOTE:** Non-Alkyd Black No. F4264 and Non-Alkyd Olive Drab No. F-4273 have the acceptance of the Army Service Forces under the TAC-ES-680b Specifications.

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**YOUR INQUIRY WILL BE GIVEN PROMPT ATTENTION**

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automotive accessories, to install the machine for production cleaning of ammunition clips. No change whatsoever in construction of this degreaser will be necessary when the time for conversion arrives.

Many machines which are now busy cleaning a multitude of parts for armament, ordnance, tanks, planes, etc., will require modifications before they can be installed in new production lines. However, they have been engineered and designed to permit changeover to new cleaning operations with a minimum of time and expense.

## Fast-Drying Rust Inhibitor Protects Metal Parts

A new rust-preventive coating for protection of metal parts and equipment during storage, shipment, and, in some cases, in service, has been developed by Witco Chemical Co., 295 Madison Ave., New York 17, N.Y. Known as Witco No. 673 Rust Inhibitor, this new product offers a combination of merits not heretofore available. It is a cold-dip, rapid drying coating that may be applied either by dipping or spraying, as its viscosity is comparable to that of water. It fully conforms to Ordnance Specifications AXS-673, Rev. 1, Amend. II, is non-abrasive, noncorrosive, and easily removed with ordinary solvents.

One feature of Witco No. 673 Rust Inhibitor is its extremely high melting point (in excess of 250° F.) and yet the coating remains flexible at temperatures of 20° below zero. The product is packaged in standard 55-gallon steel drums.

## Fungus-Resistant Coating

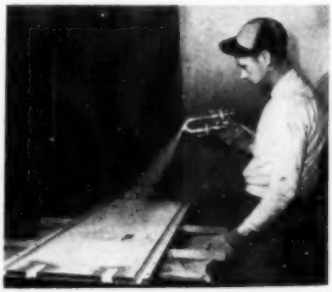
A new fungus-resistant coating for phenolic parts of communications equipment to be used in tropical climates has been developed by Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N.J. It is designed for application on phenolic insulators, terminal blocks, junction blocks, and the fixed windings of motors, generators and dynamotors.

Marketed as Durad Fungus Resistant Coating No. 524, this latest addition to the Maas & Waldstein line of fungus-resistant coatings is a varnish and is applied by spray, dip or brush. It has been successfully tested for dielectric strength, hardness, flexibility, and resistance to salt spray and thermal shock.

"Tropicalization" of communications equipment with fungus-resistant coatings is necessary because the high temperatures and humidity of tropical climates favor the growth of fungi. The growths cover the equipment and absorb moisture, causing short circuits and drifts.

## Non-Skid Walkway Coating

A new non-skid walkway coating known as "Flight Floor" has been developed in the laboratory of The Glenn L. Martin Co., Baltimore, Md., and has already seen extensive service in the PBM-3 Mariner, A-30 Baltimore and B-26 Marauder. The new coating weighs only 47.5-grams per square foot against 232.1-grams for the rub-



An employee at The Glenn L. Martin Co. sprays a PBM-3 Mariner floor with "Flight Floor," a tough, lightweight, non-skid coating developed in the Martin Laboratory. Made from Thiokol synthetic rubber, ground cork and other ingredients, the new coating adds greatly to the safety of the big flying boats, particularly in ice, snow, or wet weather operations.

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NITROCELLULOSE LACQUER, when sprayed hot, can be applied in thicker coats without sagging. "Hot" Lacquer requires only half as many coats . . . cuts cost of labor and equipment . . . saves volatiles . . . and saves time, too. Ask your supplier about the "Hot" Lacquer process.

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*CSC makes no lacquers or thinners but supplies solvents and plasticizers to manufacturers of protective coatings.*

CSC

## COMMERCIAL SOLVENTS *Corporation*

17 East 42nd Street, New York 17, N. Y.

ber matting previously used. It is applied at room temperature with an open-nozzle paint spray gun, and is easily repaired in the field. Its principal ingredients are ground cork and Thiokol synthetic rubber.

"Flight Floor" was tailor made by Martin laboratory technicians to meet a specific need of the aircraft industry —a non-skid surfacing material for floors and walkways that would stand up under hard wartime usage, and still would not add appreciably to the weight of the airplane or the time involved in its production. Other properties desired in the new material included good adhesion to metal, plywood and painted surfaces; flexibility and resiliency at temperatures from minus 20°F. to plus 160°F.; fire resistance; resistance to gasoline, aromatic fuel, oil, de-icer and hydraulic fluids, salt water and oxidation; and easy repair in the field. That the new compound can meet these specifications has been demonstrated by a series of exhaustive tests as well as by actual field trial.

In production use "Flight Floor" is applied with a regular open nozzle paint spray gun. One application only is needed to build up a coating of sufficient thickness. The material dries rapidly and panels coated with it may be stacked on end after two hours drying and a light dusting of talc. Twelve to fourteen hours are required, however, before the material is ready to undergo use. Alternate methods of application are with a knife or brush, the later method being particularly recommended for field repair. Patches applied in this manner show excellent coverage and adhesion and blend well with the original coating.

Today "Flight Floor" is a military product, but like so many other wartime developments, it, too, holds great promise for the commercial air age.

---

The National Safety Council reports that last year, while 18,500 workers lost their lives as a result of accidents on the job, no fewer than 26,500 were killed on the streets, in other public places and at home.

## Conveyorized Dip-Tank Setups

CONVEYORS are being employed more and more in metal cleaning, protective coating and paint drying operations. Originally conceived to merely transfer parts and products from one operation or work station to another, the modern conveyor's function has been enlarged to include partial or complete performance of certain production operations. For instance, the complete mechanical dipping of products into tanks of cleaning solution, rinse water, rust-proofing treatment, etc., and withdrawal of same; also the submerging of products into tanks of paint, passage through flow-coating or automatic spray painting stations, passage through drying ovens.

All of this and more can be handled with overhead conveyors. Not only does the conveyor dip and withdraw the parts, but it controls and makes uniform the interval of time those parts are subjected to the treatment or operation. Inexperienced workers can be quickly and easily trained to hang the parts on the conveyor at one station and take them off at another; and the workers work in safety, keep clean and comfortable, while predetermined quality production continues steadily forward.

The illustration accompanying this article shows a view of a conveyorized installation which might really be called an automatic machine for cleaning and rust-proofing automotive parts. It is in the Autocar Co.'s plant at Philadelphia, Penna.

All parts for overseas shipment are handled by this one machine, except for extra large units, such as driveshafts, which are given the same treatment in process tanks.

# APPEAL

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The appeal of your product can be increased immeasurably with a suitable, flattering finish. Our Creative Studio is anxious to help you devise the stain, lacquer or paint you need.

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*Manufacturers of Protective and Decorative Coatings*

Oily and greasy parts first receive an emulso-dip treatment in a regular Magnusol-kerosene cleaning mixture. Parts requiring only removal of finger marks are charged into the machine at a point further along. After the emulso-dip stage, drained parts are flushed with cold water spray and finally rinsed in a hot water dip.

Finger marks must be completely removed. They act as focal points for rust formation, particularly where any exposure to salt air may take place.

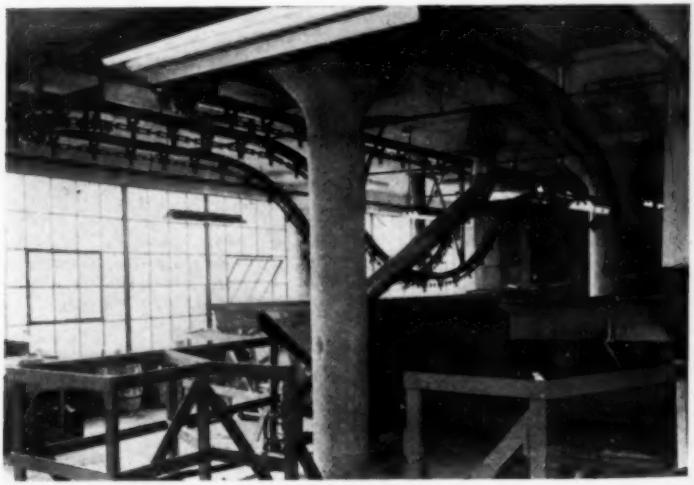
All work is dipped in a special solution which removes finger marks and is then hot-air dried. Cleaned work, cooled after the hot-air drying stage by travel on the conveyor down the remaining length of the machine, is now ready for rust-proofing.

The machine gives any one of three specified rust-proofing treatments, depending on the type of part concerned. The proper tank for each treatment is placed in position by a simple push-button control. Actual treatment consists of a dip into the solution, after which the parts travel through a drying zone to issue from the machine completely clean and rust-proofed, ready for packing.

The principles embodied in this special conveyorized machine can be readily applied to the design of other machines for handling spare parts of any size or character, from units for large equipment to smallest elements of radios.

More and more equipment of this type will be used in production departments for civilian goods. It offers advantages that are vitally important in the continuous, quality manufacture of many products.

*(Photograph and data for article supplied by Magnus Chemical Co.)*



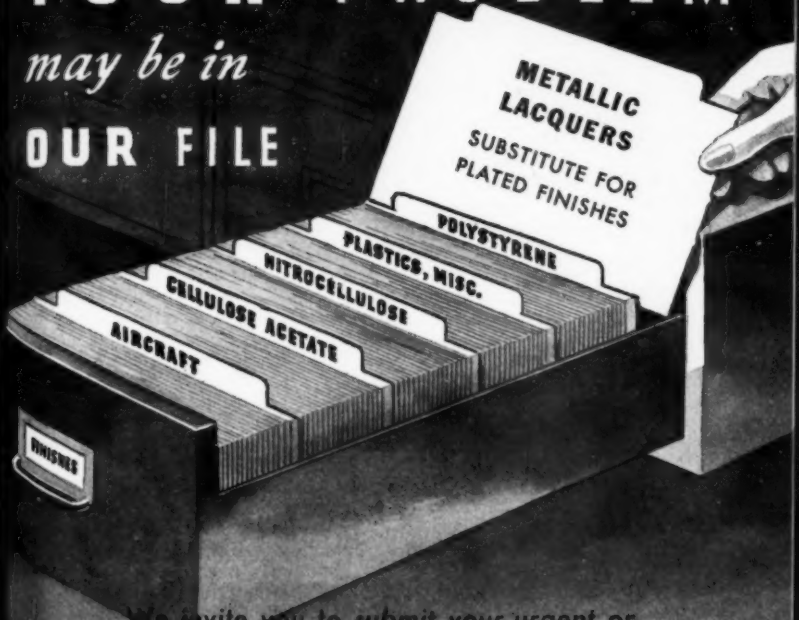
Typical view showing overhead conveyor line arranged to carry suspended parts, dip them, pass them through tank for predetermined length of time, withdraw them, and move them to and through the next operation.

*The answer to*

# YOUR PROBLEM

*may be in*

OUR FILE

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# RANDOLPH

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# Questions and Answers

## Refinished Furniture Chips and Peels

We are in the refinishing field. Our work is about 80% kitchen sets and 20% bedroom furniture. Operations are as follows: Sanding the old finish thoroughly; then applying a thin coat of ivory lacquer undercoat. After filling all cracks, pin holes, etc., with "fix it" putty, allowing this to dry and sanding it lightly, we apply a second coat of ivory undercoat. This is allowed time to dry thoroughly. Our grainer grains the sets in bleached mahogany, maple, walnut, etc., using varnoline and oil colors. When the graining is dry we apply clear lacquer.

The sets certainly look beautiful when complete. But this is our complaint: The paint has a tendency to chip and peel.

Some refinishers apply the first undercoat in oil or synthetic base; then they apply clear lacquer, followed by graining; then clear lacquer on top.

What is your opinion, in order to overcome this chipping and cracking difficulty?

We do not want to increase our cost by using paint remover and making a natural finish.

In your opinion, which is better for graining, water color or the varnoline and oil stains?—J. P.

---

The data you have supplied is not entirely complete, but from what is given, it is not surprising that some trouble with adhesion and brittleness is encountered. In brief, inadequate provision is made for bonding your new coating to an old hard dry finish. Your underlying coats are all of a "short" pigmented nature.

Initially, wet sanding is preferable for this type of work. I suggest using a high-flash naphtha (varnoline) as a wetting agent for ordinary dry-back abrasive paper. This abrasive cuts all surface film and grease quickly, as well as providing fast cutting with a minimum of abrasive paper consumption.

In the event that the old finish is of a type that tends to soften or roll up with the naphtha, your only recourse is to use water-resistant paper and water, or do dry-sanding. In any event, it is advisable to use a relatively coarse abrasive paper for this work—one as coarse as 3/0—to assist in providing a "tooth" for subsequent coatings.

In this kind of work, where a relatively heavy-pigmented finish is built up, the first coat on the old surface should be a thin, clear one. It is mandatory that a secure bond be made to this old surface before any attempt is made to build it up.

A coat of the same clear lacquer that is used as a finish coat, in a little thinner consistency, would serve admirably, as would shellac, or one of the very serviceable substitute shellacs advertised in this magazine. The shellac or substitute should be applied as a thin washcoat. It was an axiom with the old timers that, in refinishing

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Business goes where it is well treated. O'Brien's constantly stress the rightness of the other fellow's business. We fully realize that volume production and repeat sales are necessary for continued business. That is why O'Brien's have directed their efforts toward thorough coverage of the midwestern industrial area where their plant is located.

O'Brien's organization is flexible enough to permit immediate attention to emergency needs of both the small purchaser and the large industrial firm.

Painstaking care is given to each order and its individual items by every employee who handles the order. In the belief that "it's the little things that count," O'Brien's strive to observe meticulously the customer's special notations on the order.

Fully cognizant of the veteranship of many individuals within their customer organization, O'Brien's respect the special conditions of repeated orders, usually stated implicitly by the words "as before" appearing on the new order.

O'Brien's have a two-coat cabinet finishing combination which is made up of their No. 8393 Undercoat and No. 8392 Cabinet Enamel. The former, when applied by spray gun to bare wood, produces uniform color and texture, while the latter, applied by spray over the first coat, achieves a desirable satin lustre on such standard items as kitchen cabinets and similar pieces. This combination of coatings assures a long-wearing, smooth-looking finish that blends nicely with appliances found today in well-appointed kitchens, laundries and breakfast nooks.

Your finishing inquiries will receive prompt and courteous attention at O'Brien's.

**O'BRIEN VARNISH CO.**
**South Bend 21, Ind.**

a piece, the first thing to go on was a thin coat of shellac to establish a clean fresh surface to which any following coat would stick. If clear lacquer is used as a first or bonding coat, the puttying can probably be done on this coat, before the application of the ivory undercoat. As a compromise, the ivory undercoat might be mixed half and half with clear lacquer for the first coat. Basically, the first coat applied to the old finish must be a tough flexible, adhesive one if it is to bond the new finish to the old one.

There is no objection to oil colors for graining under lacquer if the color is adequately dried before lacquering. By the same token, there is little, if any, advantage in using water colors. The oil colors are easier to work with. For a purpose such as this graining, with oil colors under lacquer, it is imperative that a good grade of mineral spirits be used. A little dropped on a porous white paper, like a piece of a paper towel, should evaporate completely and without leaving any trace, in about 12 or 14 minutes. If an oily ring is left, don't use it under lacquer.

You mention oil colors in varnoline and in a later paragraph a preference is asked between water color and "oil stains." It is assumed that earth colors ground in oil are what you mean here, as oil stains are an entirely different material and would not be used for graining. In the event that I have misunderstood the point here, it may be stated that the use of oil "stains" under lacquer is not recommended, especially on a nonporous surface.

To sum up my recommendations, it is suggested that you use a thin coat of shellac or substitute immediately over the old finish and under the present system, or substitute a clear coat for the first undercoat, or add clear to the first undercoat in order to get a better bond of the new finish to the old. Two surfacer coats or undercoat coats, put on directly over an old hard finish, form a brittle inadequate bonded system.—W. T. SMITH.

---

You do not say whether or not your refinish coating is chipping or peeling down to the old finish or only down to the undercoat. If it chips down to the old finish the difficulty is probably due to wax or some form of wax that was used to polish the furniture before you received it. If this is the case, no amount of ordinary sanding will remove all of the wax. It will require a thorough wet sanding with naphtha or gasoline, or a wash with a strong cleaning solution and, after rinsing, a wipe-off with alcohol.

If the finish is only peeling down to the ground coat then it appears that it may be one of many possibilities.

1) The oil colors (if used) are not dry enough before the top coats are applied, and they form a film between the ground coat and the clear top coats.

2) You do not say what kind of ground coat you are using, but it may be possible that you use a synthetic type. Then, if you apply some of the clear sealers and lacquers that are available today, over this type of material, you probably do not get sufficient bite into the undercoat. This is because of the type of solvents used in most non-critical lacquers at present.

3) It is also possible that you are making the mistake of trying to put on too much ground coat. Most ground coats are made to sand easily, therefore they do not

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ROCKFORD, ILLINOIS

have much plasticizer; the forming of a thick film of sanding medium would, in itself, chip very easily.

You ask about the best graining medium. This seems to be a matter on which every finisher has his own ideas. They don't all agree. Oil stains or oil colors, unless given proper drying time, can cause much trouble. Water colors are never the same twice in succession unless each item is measured exactly alike each time. When oil colors are used over a porous ground coat, the ground coat will absorb the oils and hold them there a long time before complete oxidation takes place. When water colors are used over a porous ground coat, the water is quickly absorbed and, unless proper drying time is given, this could cause poor adhesion between ground coat and top coats.

Oil colors ground in japan and mixed with naphtha or turpentine, with some varnish added to make the colors set, seem to be extensively used. I suppose that the varnoline you mention is a product of this sort and that ordinarily it would be okay.

What I prefer and what I hear of more men using, are the graining inks that are being used by the bed companies to grain metal beds and cheaper woods to imitate the more expensive woods. These graining inks are obtainable from the printing ink manufacturers. They are strong in color, are finely ground (many times finer than ordinary colors in oil), they set rapidly and, in most instances, can be sprayed over immediately, depending on the medium used to thin them.

VM&P naphtha will let the ink be sprayed over in about ½-hour. Oleum spirits should have at least four hours to dry. Faster naphthas than VM&P can be sprayed over in five minutes.

My suggestion for your finishing procedure would be: Be sure that all old wax and oil polish have been removed. Sand and patch all holes, cracks or dents. If you have any doubt of remaining wax, apply a very thin coat of shellac before the ground coat. Then apply a fairly wet ground coat; when dry, sand again to be sure that all holes and imperfections are taken care of. Apply a second ground coat, this one reduced and only a light coat. Grain over this and, depending on what graining medium you use, be sure to allow enough drying time before applying top coats. Apply the first top coat thin over the grained surface and let dry. Then follow with a full wet coat. The reason for the preliminary thin coat over the graining is for a fast set, so as not to run the grain lines together.—E. HOGSTROM.

## Letters from I. F. Readers

*(Continued from page 8)*

are doing in keeping your readers right up to the minute.—C. I. Co.

The material is a product of Mitchell-Bradford Chemical Co., whose advertisement appeared in August issue of this magazine.—ED.

## Detearing Equipment

We have seen several articles in your magazine concerning detearing devices for use in the application of dipping and flow coating paints. However, we can not seem to find any source of supply for equipment of this type. Would you kindly advise us as to several sources where it would be possible to secure electric apparatus for this purpose? Your immediate reply would be greatly appreciated.—M. P. Co.

The only concern manufacturing this equipment is Harper J. Ransburg Co. (Electric Coating Division), Indianapolis, Ind.—ED.

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# Editorial

## Waterproof Plywood as a Postwar Material

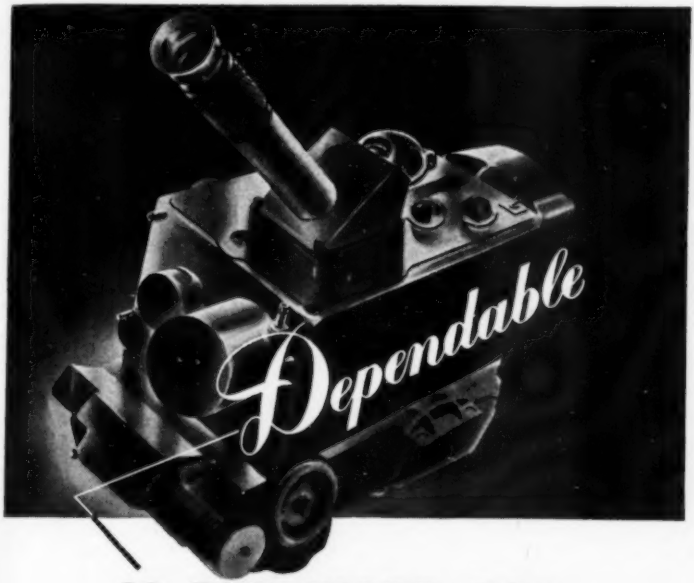
★ The large-scale production of waterproof plywood for boats and aircraft during the war have opened up new possibilities for plywood in the industrial and architectural fields. Strong, light, and having good heat-insulating properties, plywood has always been limited because it delaminated when exposed outdoors or in an atmosphere of high humidity. The best water-resisting glues available until a few years ago were subject to attack by molds. However, the development of thermo-setting resinous adhesives has made possible plywood that is really waterproof and moldproof. The large-scale production of waterproof plywood has lowered costs and enormously expanded production facilities.

After the war, waterproof plywood will come into its own in the industrial and architectural fields. It may be used in the "flivver planes" and helicopters promised us by the aircraft designers. Having more stiffness than the light metals, fewer structural members will be required than for the light metals. In fact, the development of the bag-molding process has made it possible to form whole fuselages for aircraft or whole hulls for boats in one molding operation. This is in contrast to the old method of building the framework and then covering it.

Pleasure and patrol boats, automobiles, trucks, trailers, and furniture may use substantial amounts of waterproof plywood. In the architectural field it may be used for both inside and outside walls, partitions, doors, and shutters.

Waterproof plywoods impregnated with synthetic resins or resin-forming chemicals and cured, or compressed and cured (Compreg), also offer unusual proper-

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

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CLEVELAND, OHIO · LOS ANGELES, CALIF.

ties. The impregnating resin confers high dimensional stability to the sheet under all moisture and humidity conditions. The same process applied to solid woods confers added strength as well as high dimensional stability. This can mean hard, wear-resistant floors, and drawers and windows that will not stick in damp weather.

Because waterproof plywood and resin-impregnated woods do not swell nearly as much as solid woods in damp weather, the harder, faster-drying finishes can be used on them. There is little danger of checking and cracking under exposure conditions. Thus it may be possible to paint all parts of a prefabricated house completely in the factory, except for a final coat which is applied after assembly. Since oleoresinous and alkyd materials will be used rather than straight oil paints, fast finishing schedules are possible.—R. H. W.

## Reconversion in Wood Furniture

Reconversion will not be a serious problem for the wood furniture industry. This is especially true in regard to plants and equipment. Most wood furniture manufacturers, when they changed from civilian to war production, had only minor changes to make in their equipment. Machinery used for making and finishing wood furniture could be used to make almost any type of wood products for the war. In some instances, such as presses used for gluing plywood for aircraft construction, it was necessary to install different machinery. Most of the wood furniture industries have already completed their war contracts and are now on limited civilian production.

During the first six to 12 months following the end of the European war we may experience a critical shortage of lumber. This may be partially brought about by our having to supply lumber to help rebuild the war-torn cities of our allies. It will probably force many manufacturers of wood furniture to use very cheap grades of lumber and perhaps composition material for drawer interiors, backs of cases, etc.

One large concern, well known for its high-grade furniture, is now getting out new designs (one piece of each design) and finishing these in enamel; then glazing and highlighting. This treatment makes a beautiful suite. If restrictions on lumber make it necessary, this company can use a cheaper grade of lumber, as the enamel will cover up any discolorations, etc.

The new treatment for making hardwoods from soft woods will be available immediately after the war. This will be a boon to furniture manufacturers. It will allow them to use woods that formerly were unsuitable for furniture. I think this will be one of the important things in helping to solve our reconversion problems.

Several furniture manufacturers have their draftsmen busy designing new suites for postwar production. They are making one piece of each design, finishing them and setting them aside for their salesmen and prospective customers to inspect and criticize.

Decals will help to solve some of our reconversion problems. I believe that we will see some suites entirely covered with decals in reproductions of walnut, mahogany, prima vera and other fine cabinet woods. Much progress has been made along this line in late years.

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Plastics will be more widely used, especially for decorations. If restrictions on the use of wood are severe, we might see plastic tops on wood dressers and table tops.

We will probably see a number of different ideas in color decorations; and, of course, there will be some great changes in fillers, sealers and top coats. While finishing material manufacturers are now handicapped, due to restrictions on the use of vital materials, I am sure they are busy formulating new materials for reconversion. Many of these new materials are now ready, and at the "Go" signal from the War Production Board they will be available for use in the furniture industry. Some materials will be revolutionary in character. I look for them to produce finishes that will far surpass anything seen before, as to beauty and durability.

Recently I tried a sample of a combination lacquer-type stain and filler that can be coated over in five minutes after application. It produces a lasting color and fills perfectly. Of course, there are some improvements to be made in this stain-filler as to wiping, etc., but it will be in the reconversion picture.—H. W. CHESTER.

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## *The Significance of Film Thickness*

BY ROLLIN H. WAMPLER

★ The actual thickness of the dry film deposited on an industrial product during finishing operations has a vital bearing on the appearance and durability of the finish. Total dry film thicknesses may vary from .1 to 3 mils (one mil is one-thousandth of an inch), or 2.5 to 76 microns. One normal coat of varnish of 50% non-volatile content may have a dry film thickness of .8 to 1.5 mils. Clear lacquers will run somewhat thinner, one coat leaving a film from .2 to .7 mil thick. Enamels and primers can be coated substantially heavier than clear varnishes and lacquers.

On some products, the thicker the film the better the durability. For example, oil-base house paints are so formulated as to weather by chalking rather than peeling. In other words, the surface disintegrates and washes down, the remaining film becoming thinner and thinner. It is then repainted. Recent studies have shown that for a given formulation the durability is directly proportional to film thickness up to a certain optimum, as one would expect from purely theoretical considerations. Thick films are desired where the surface is to be rubbed, to minimize the danger of cutting through and to produce the desired "depth."

Where surface abrasion is the main factor causing breakdown, it is obvious that the thicker the film the better the durability. Sometimes penetration by moisture is an important factor in causing breakdown. For example, where a wood product is alternately wetted and dried, a heavy protective film obviously minimizes moisture fluctuations in the wood and reduces the alternate swelling and shrinking which might cause the film to crack. Similarly, where a steel surface must be protected against rust, heavier films are more impermeable and give better protection.

Where the article is subjected to flexing and bending, sharp impacts, and stresses, thinner films give better durability because they are not as subject to cracking and give better apparent adhesion.

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to apply several thin coats rather than one or two heavy coats, especially when oxidizing materials are used. For example, a heavy coat of a quick-setting rubbing varnish will dry quickly on the surface but will remain soft underneath for many days. One might think it would eventually harden. Of course, the solvents do eventually leave and the lower layer oxidize, but the film is spongy and soft rather than hard and tough. The reason is because the inner layers have no opportunity to shrink to a dense film, and the factors that would ordinarily produce shrinkage produce porosity. This is not nearly as true of heavily pigmented films such as surfacers as it is of enamels and transparent films.

Dry film thickness on metal is measured by an electrical device, or by means of a sensitive micrometer. Wet film thickness on any surface may be measured by means of the Pfund film gage. The wet film thickness is always greater than the dry film thickness, since the solvents leave the film in drying. A wet film thickness of three mils may leave a dry film one mil thick with a varnish of 40% nonvolatile content. Devices and techniques for measuring film thickness are described in Gardner's "Physical and Chemical Examination of Paints, Varnishes, Lacquers, and Colors."

Thin films dry faster and have poorer gloss than thicker ones. An 85 sheen flat varnish may show a sheen of 80 in thin film, 85 in normal films, and 90 in heavy films. Variations in color and gloss of enamels may often be explained by variations in film thickness.

The alert finishing superintendent must realize that film thickness is fully as important in finishing operations as are dimensions in cabinet work. For this reason he should have devices available for measuring film thickness. He can set up and maintain optimum film thicknesses in all finishing operations. Often these devices will help him out of baffling trouble.

---

**Curbing Optimism**—Canvassing a cross-section of industry some days after Donald Nelson's recent pronouncement of civilian goods resumption, the New York *Times* found that a cautious attitude was in order. Despite the gaudy headlines that greeted the original news, no justification was uncovered for wild-eyed celebration.

According to the N. Y. Housewares Mfrs. Assn. (enameled ware), the order merely upset a situation that had been going fairly smoothly. In many fields, reports were received of widespread cancellations on old pending orders. One observer summed up the situation in these words: "We haven't been able to produce the goods that were permissible *before* this order, because of the lack of labor. It's still a question of manpower."

* * *

**Warning to Business**—Upwards of 4,000,000 workers may be released from their war jobs on the collapse of Germany, we are warned by A. Ford Hinrichs, acting com-

After a war-enforced absence, this much-wanted finish is available again. Are your requirements for military or essential civilian uses? Your orders can now be filled for Hilo No. 916 Black Crystal where the need coincides with priority regulations.

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**Navy**
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**Coast Guard**
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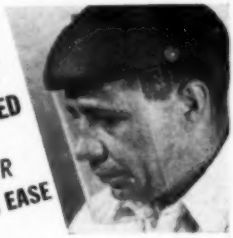


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M.S.A. Faceshields provide protection, durability and wearing ease on every job where light flying particles are encountered. Clear or green cellulose acetate visors. Three-way, fully adjustable headgear fits natural shape of head. Write for Bulletin CE-23.

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Braddock, Thomas and Meade Streets
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**5 Gallon BLUE BOY Model**

**PAINT REJUVENATOR**

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion-proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating equipment—ten years—thousands of satisfied users.

**Miracle Paint Rejuvenator Co.**
127 E. 9TH STREET ST. PAUL, MINN.

missioner of the Bureau of Labor Statistics. Another half million will probably be dropped from the government pay roll at that time, he adds.

The picture does not look totally black to this expert. "We may be saved from a serious nation-wide unemployment problem," Hinrichs declares, "because of the continued volume of Government expenditures and the large consumer demand." He fears, however, that it will be almost impossible to achieve full use of released manpower, because some plants that are needed for civilian production will have to be retained in war manufacturing.

* * *

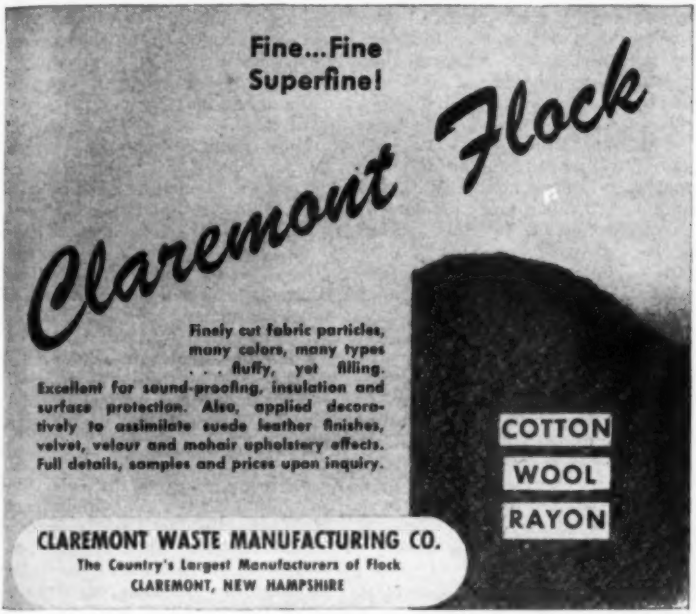
**Scrubbing Steel**—"Flame-priming," widely extended in use during the war, is expected to be adopted in many new fields with the approach of peace. This process, developed by the Linde Air Products Co., employs fiery "bristles" of oxy-acetylene flame to sweep over steel surfaces, the intense heat causing scale to expand and pop loose.

The high heat engendered dries the metal surfaces completely, and either devours or neutralizes any rust, foreign matter or oil that may be encountered. It is maintained that this technique, when used immediately before the application of a priming paint, increases coverage and delays corrosion.

* * *

**Television Means Jobs**—Television can be more than a great new entertainment medium; it can be a potent sales force in our peacetime world. That is the view of Walter L. Lawrence, field engineer of the R.C.A. Service Co.

Department stores will be able to bring style shows into the home, he tells us, and the visual presentation of wares will increase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CLAREMONT WASTE MANUFACTURING CO.
The Country's Largest Manufacturers of Flock
CLAREMONT, NEW HAMPSHIRE

consumer appeal. According to Lawrence, if television increases the demand for goods and services by only 1%, that would mean 460,000 new jobs in terms of 1940 employment standards.

* * *

**Key to Efficiency**—What are the factors that have the greatest influence on increased factory production? That is a subject of never-ending debate among industrial engineers. Some noteworthy answers are supplied in a study of English labor recently released by the British Industrial Health Research Board.

After observing 21 groups of factory workers over a 12-week period, it was found that a reduction of the work week did lead to increased output. Men were held below 60 to 65 hours, and women below 55 to 60. In some cases, hourly output went up 20%, while the average was better than 4%. But other factors were found to be equally important—such as the planning and control of the means of work, of the machines and their layout, and of the design of the product.

Here is an interesting sidelight, confirming the views of many astute American production men: When stocks of materials were low, workers had a tendency to spread out the work to make it last;

when supplies were plentiful, the workers had a tendency to speed up their tempo. In both cases, it must be noted, the flow of materials to the machines was regular.

* * *

**Furniture Prospects**—The outlook for furniture manufacturers continues far from rosy. With the allotment system for lumber in effect, production for the balance of 1944 may be cut from 30% to 60%. The industry is in an uncomfortable situation; Government contracts are being sharply curtailed, and in many instances labor is available for civilian goods production, with raw materials serving as the primary stumbling block.

Some furniture manufacturers are maintaining a philosophical attitude in the face of their present difficulties. The fact remains that, until recently, the industry was affected far less by the pressure of war than dozens of other lines.

* * *

**Flying Station Wagon**—The most intriguing aviation innovation suggested in many a moon has been announced by the York Research Corp. of New York. It is an "air commuter," which includes a small light car along with the plane.

The idea is simple enough. The plane has a back ramp, up which the bantam-weight auto is driven into the nose of the ship. Remaining at the wheel of the car, the driver controls the plane with perfect ease. Two passengers can be accommodated along with the car, or four if the auto is left out. The Air Commuter weighs slightly over 3000-lbs., cruises at 115 miles per hour, and will sell for around $5000, complete with the car!

* * *

**The Future of FM**—Apart from the small inexpensive sets, General Electric plans to incorporate frequency modulation in almost 90% of the remaining units when peacetime production is resumed, according to H. A. Crossland, sales manager of that company's receiver division.

More than 5,000,000 FM home radio receivers will be on the market within 18 months of the war's end, he predicts, and some of them may retail as low as $60. Crossland feels that the industry will need five to six months before large-scale merchandise production can be resumed.

* * *

**Color Boosts Morale**—Color engineering is being gradually accepted as a vital factor in increasing plant efficiency. In addition to relieving monotony, cheerful hues are found to reduce factory accidents.

A recent convert to color coordination is the Philadelphia plant of Henry Disston and Sons, saw manufacturers. In a typical factory section, the dado is painted a pleasant tone of gray, with white above. One end wall is tinted blue, while the opposite side is yellow. Restful blues and greens are found effective for the relief of glare in offices, and to prevent eyestrain.

* * *

**Not Licked Yet**—A nation that learned to build a Liberty ship in 11 days should be able to solve the peacetime problems that lie ahead of us. That is the bright thesis of Harvard University's famed economist, Professor Sumner H. Slichter, as expounded recently before the Committee for Economic Development.

Dr. Slichter has some heartening facts to toss at the prophets of doom. More than 600 articles made from iron and steel have not been produced for over two years, he points out, citing the vast backlog of demand for vacuum cleaners,

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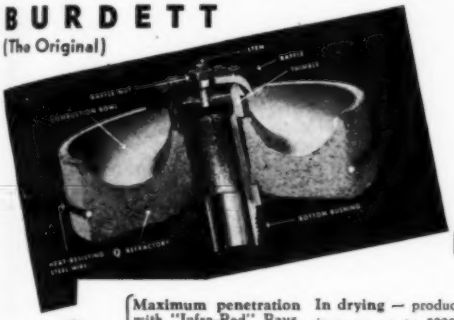
(The Original)



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**DECORATIVE**

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced—

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radios, refrigerators, electric irons and toasters. To this competent observer, another reason for optimism is the tidy total of 75 billion dollars saved by the American people in three years.

Nevertheless, he agrees that we must be ready to face a temporary period of painful readjustment. Two years after the war, says the professor, government expenditures will have dropped from 90 billion to 25 billion dollars a year—"the greatest and swiftest disappearance of markets in all history."

* * *

**Fewer Models**—While many firms are announcing plans for bigger postwar lines than ever, at least one manufacturer is taking an opposite tack. Electromaster, Inc., of Detroit, formerly offered a dozen types of electric ranges. In its peacetime production program, the company aims to reduce the number to only three or four.

At the same time, this organization is hatching a scheme to turn out 100,000 units annually, or twice its prewar capacity. According to Vice-President Gerald Hulett, model curtailment will enable his firm to have better and cheaper production runs, besides reducing dealers' inventory costs. Hulett has a commendable goal—to make Electromaster "the Ford of the electric range industry."

* * *

**Prodding the Big Fellows**—In the opinion of J. Gordon Lippincott, industrial designer, the "old line" companies will have to keep up with their energetic small competitors on product design or else they will be put out of business. He refers to all types of consumer goods in this sweeping judgment—automobiles as well as sewing machines and lawnmowers.

"Industry would prefer to put the 1942 product back on the market as soon as the war is over," he says, "because it is easier to do so." However, Lippincott points to the thousands of smaller concerns that mushroomed overnight from garages or machine shops to full-fledged war plants. They will be entering the consumer field, he maintains, and they will be thinking in terms of 1945 designs.

* * *

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The Pliastic film, when dry, is a semi-transparent, glossy, flexible coating with excellent heat-sealing properties. When used in the liquid state for bonding materials it can be applied to one or both surfaces, the speed of setting being dependent upon the porosity of the materials used.

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BOMB SIGHT BOXES
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LT. GENERAL George S. Patton's Third Army broke through the Normandy defenses, crossed the Brittany peninsula, pushed north and eastward and boxed Hitler's Seventh Army into the Falaise pocket where it was cut to pieces.

While this is being written, his armored columns have crossed the Seine and the Marne and are severely harassing the retreating Nazis. It was the able and audacious leadership of General Patton that enabled us to bring our fighting men and their armies into full effect against the Nazis.

All of us on the home front pray for their continued success and for an early Victory.

*Listed here are a few of the war products now being coated with our materials. Phone, wire or write and let one of our finishing experts help you "keep production rolling."*

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### POSITION WANTED.

Finishing Foreman, Industrial Sales or Technical Service Man, 23 years industrial finishing, past 10 years as Production Foreman. Air dry or baking material. Wood or metal. All replies held strictly confidential. Address IF-126, care Industrial Finishing.

### POSITION WANTED

By foreman finisher experienced in radio cabinets, office desks, furniture. Prefer medium size town. Can handle any number of men; 25 years' experience. Address IF-123, care Industrial Finishing.

### LACQUER MANUFACTURERS!

Sole distributorship wanted for all or part of New England for full line Industrial Lacquers and Synthetics by finishing expert and consultant who knows and has sold trade. Address IF-114, care Industrial Finishing.

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Wanted for our new development laboratory with special aptitude for long range research in protective coating field—

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### SUPERINTENDENT

Wanted for a new and modern Paint Plant of medium size, making both Industrial Finishes and Aluminum Paints. Plant located in a large Central States city. Position offers excellent opportunity to man accepted, both now and after the war. Write, giving full information on experience, qualifications, age, salary expected, etc. Must comply with W. M. C. Regulations. Address IF-116, care Industrial Finishing.

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Capable of matching all types of stains and water powders for furniture trade. Chemist or man with laboratory experience preferred. State age, draft status, experience, salary desired. Address IF-117, care Industrial Finishing.

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Modern, adequately staffed Midwest plant; aggressive advertising, full cooperation. This is a job with unusual present and postwar possibilities. Address IF-120, care Industrial Finishing.

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Qualified by experience to call on the Industrial Finishing Trade. This position is very desirable and offers unusual opportunities. There is a good volume of established business, much of which is local and traveling is a minimum. The earnings are excellent. Our factory is located in a midsouthern city and we are old established paint, varnish and lacquer manufacturers. Our own employees know of this ad. In reply, please give complete detailed information about yourself which will be held in strict confidence. Address IF-121, care Industrial Finishing.

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Wanted—for New York and surrounding territory, by an old-established eastern manufacturer of lacquers, enamels, synthetics. Submit full qualifications and information when replying. Address IF-127, care Industrial Finishing.

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### WANTED.

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Gold Bronze Spray and Burnish Powders, any quantities, large or small. Address IF-124, care Industrial Finishing.

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Work Tank—33" wide x 58" long x 28" from bottom to condensing coils. Height overall 64". First-class condition.

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The author, Jeffrey R. Stewart, F. A. I. C., is editor and publisher of the National Paint Bulletin. He was formerly associated as research chemist with Dr. Henry A. Gardner of the National Paint, Varnish & Lacquer Association.

The heavy green covers are attractively embossed and have raised gold letters on a panel of red. The price of this elaborate volume, which looks like $15.00, is only $7.50.

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stantly lead the user to all possible subjects relating to formulas or processes which are of interest. It may be obtained direct from Industrial Finishing Magazine. It is $4.00 a copy.

## Book of Air Processing Equipment

Paint spray booths, paint drying ovens, air make-up systems, process ventilation and dust collectors are described and illustrated in a new 56-page coil-wire-bound book prepared for free distribution among executives by Peters-Dalton, Inc., 626 E. Forest Ave., Detroit 1, Mich. The book contains specifications, charts and valuable engineering data. Pages are 8½x11-in.

## Free Book on Adhesives

A new booklet that will prove helpful to anyone using adhesives or coating materials, impregnators, spray-on insulators and sound-deadening compounds is entitled "3-M Adhesive Data."

This booklet lists the various formulas as made by Minnesota Mining & Mfg. Co., Adhesive Division, Detroit, Mich., and shows the viscosity, bonding range, method of application, etc. If you have a problem, reference to the book will prove helpful in the selection of the correct material to use. This booklet is available upon request from Minnesota Mining & Mfg. Co., Saint Paul 6, Minn.

## ABC of Luminescence

"The ABC of Luminescence" is the title of a 24-page book wherein The New Jersey Zinc Co., 160 Front St., New York, N.Y., gives you a clear picture of luminescence by discussing, in simple ABC language, the characteristics, properties, limitations and applications of the inorganic luminescent pigments. A number of simple tables and charts are included to illustrate various terms. Copies of this 8½x11-in. book are free.

## Book on Paint and Lacquer Solvents

A 64-page book that gives specifications and other information about alcohols, ketones, esters, aromatic and aliphatic petroleum naphthas, and coal-tar naphthas has been prepared and published by Chemical Solvents, Inc., 60 Park Place, Newark 2, N.J. The title of the book is "Solvents - Alcohols - Extenders." Copies are free to solvent users.

## Heat Exchange Equipment

The National Carbon Co., Inc., 30 E. 42nd St., New York 17, N.Y., announces a new and attractive catalog Section M-8802, which describes and illustrates "Karbate" corrosion-resistant heat-exchange equipment.

This booklet sets forth several charts and tables covering the heat conductivity and the physical and chemical properties of carbon, graphite and "Karbate" materials. It contains a great many illustrations and drawings indicating the versatility of these materials in the design and execution of an extensive variety of heating and cooling units.

## Magnesium Book Free

"The Collection and Control of Dust and Fumes from Magnesium Alloy Processing" is the title of a new booklet just issued by Peters-Dalton, Inc., 626 E. Forest Ave., Detroit 1, Mich.

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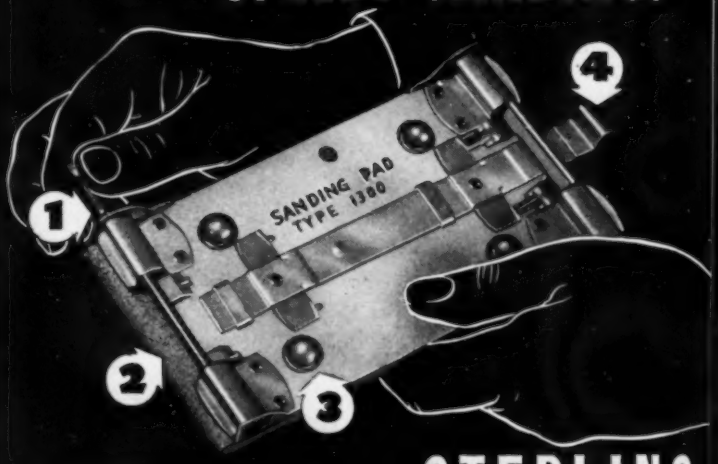


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